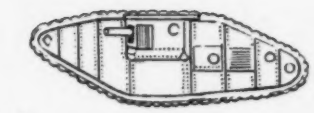
ARMORED CAVALRY JOURNAL



Doughboys and tanks going into action in the Philippines. This photo was salvaged from the camera of Lieutenant Robert Fields, Signal Corps Photographer, who was killed in action shortly after the picture was made.

Signal Corps Photo

SEPTEMBER-OCTOBER, 1946

The Saga of Number 311

by Lieutenant Commander Norman Myrick, USNR

The hog fanciers knew her as a promising Duroc. The Crossroads scientists on the laboratory ship *Burleson* knew her as a number. The society with the long name knew her as a challenge.

She was a California pig who joined the Navy in company with several thousand other animals, pigs, goats, rats, guinea pigs, to serve as living instruments in the task of tracking down the secrets of nuclear fission. Like all good sailors she was given a number and a battle station. The number was three eleven, the battle station, the Japanese cruiser *Sakawa.*

On the morning of 1 July 1946 the little pig was a nobody. On the morning of 3 July 1946 she was a porcine celebrity. Such is the effervescent nature of fame. It happened in this fashion.

The *Sakawa* was anchored in Bikini Lagoon among the Marshall Islands. Surrounding her were some twenty-two other ships designated as targets for the Atomic Bomb. At nine o'clock on the morning of July 1 the bombardier of Dave's Dream, a B-29 airplane, pressed his release button and the first atomic bomb ever to be released against naval craft arced down on the target fleet. The *Sakawa* was sorely hurt and the following day she slid quietly under the waters of the Lagoon to keep a rendezvous long overdue. About four hours after the *Sakawa* went down the crew of a salvage boat found a pig swimming in the radioactive waters of the Atoll in the vicinity of the *Sakawa's* demise. It was number 311.

The little pig was picked up and taken back to the *Burleson.* The skill and knowledge of the nation's foremost scientists were mobilized to aid in the long struggle for survival that was to follow. On the U.S.S. *Appalachian,* Crossroads Press Ship, one hundred and twenty newsmen fed the story to the four corners of the world. Here was a heroine who had met the thunder of the atom and survived. Here was one who had swum in waters fairly sparkling with radioactivity and lived to grunt about it. Here was a story. The science people saw a profound significance in the pig's deliverance. The sob sisters found a great pig-interest story and the breeders of hogs from Maine to California grew expansive in the golden noonday of pig publicity. At Dallas the authorities made a bid for her personal appearance at the State Fair. At Seattle a swimming race exclusively for pigs, known as the Bikini Derby, celebrated her triumph over the atomic bomb. On the *Burleson* the bitter fight for life went on without surcease.

The will to live was strong in the little pig. The medical resources of a Joint Task Force are formidable. The old man with the scythe was forced to retire. The recovery was complete. Indeed there was talk that the heroine will soon fulfill her destiny as a girl pig. It is said that the patter of little pig's feet, perhaps somewhat radioactive, will bring added luster to the proud number of three hundred and eleven.

Whether or not the little pig resents this intrusion into the most intimate corners of her privacy we do not know. All that we do know is that she who was doomed to die in the interests of science and the atomic bomb has taken her place with the little pig that went to market and the conqueror of the big, bad wolf, among the pigdom immortals.

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CONTENTS

THE SAGA OF NUMBER 311 ..... Inside Front Cover
By Lieutenant Commander Norman Myrick, USNR

PATROL TO SAOERI 2
By Captain G. S. Andrew, Jr.

SONAR BEAT THE SUB 13

U. S. CONSTABULARY 16
By Major General Ernest N. Harmon

THE 86TH CAVALRY RECONNAISSANCE SQUADRON 19
By Lieutenant Colonel Harry C. Brindle

THE 89TH CAVALRY RECONNAISSANCE SQUADRON 20

THE 92D RECONNAISSANCE SQUADRON 22

THE 80TH CAVALRY RECONNAISSANCE TROOP 23

THE 104TH CAVALRY RECONNAISSANCE TROOP 24

36TH SQUADRON IN THE ETO 25

Reconnaissance Platoon in Front of Infantry Division 25
By Lieutenant Allen L. Zediker

Tank and Reconnaissance Combat Teams 25
By 2d Lieutenant Leroy O. White

Deceptive Action by Reconnaissance Patrols 27
By Captain Roy L. Huckabee

The Assault Gun Platoon in Offensive Action 28
By 1st Lieutenant Robert L. McMahon

GAPA—AIRCRAFT OF THE FUTURE 29
By Major Hal D. Steward

EDITORIAL COMMENT 30

ATOM BOMB COMMENTARY 33
By Major Hal D. Steward, Associate Editor

SUPPLY OF AN ARMORED DIVISION IN COMBAT 34
By Colonel E. Busch

OTHER BRANCHES 35

The Field Artillery 36
By Colonel Robert F. Hallock

Cooperative Training—Infantry and Armor 39
From The Infantry School

Development of the Airborne 40mm AA Gun 42
By Major Thomas G. Gentel

The Gallant Little "L" Plane Had Versatile Uses in World War II 45
By Charles Villency

Medical Care in Combat 47
From Surgeon General's Office

Marine Tank Lessons Learned at Guadalcanal, Bougainville and Tarawa 49
By John L. Zimmerman and Joel D. Thacker

Army Transportation Corps 51
By Lieutenant Colonel Russell F. Oakes

TANK AND ANTITANK 55
By Brigadier R. M. P. Carver

THE RUSSO-GERMAN BATTLES—1941-45. Part I 62
By Captain Fergus N. Fitzgerald

JAPANESE PREPARATIONS FOR PHILIPPINE CONQUEST 68
By Captain T. W. Davison, U. S. Navy

RETURN OF THE NATIONAL PISTOL AND SMALL-BORE MATCHES 72
By Leonard J. Grassman

AGF OUTLINES ORGANIZED RESERVE TRAINING PROGRAM 74

BOOK REVIEWS 75

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PATROL TO A

by Captain G. An

Captain George S. Andrew, J ls one interesting patrol stories to c ut of story of 36 American soldiers eir fi jungle. Captain Andrew is ra estab fessional writer. See his stor e 41s in the July 27, 1946, issue of atur

"YES, there're Japs in there, alright."

The stocky lieutenant sat down on a camp stool and looked ruefully at his bandaged hand.

The captain didn't say anything. Out in front of the troop headquarters tent an ambulance crew was loading into their vehicle a litter case, a wounded native and a walking casualty.

The captain was annoyed. Not because his patrol had been ambushed right on top of its objective, but because the man on the litter, with his guts full of grenade, was to have been made a first sergeant tomorrow. Patrols sometimes got themselves ambushed, but good First Sergeants were hard to come by, what with rotation, and jaundice, and Jeez knows what-all. Anyway, it was starting to rain again—great big drops that fell like tracers through the headlight beams of the ambulance. It was after midnight, and the patrol had spent most of the day and half the night bringing the wounded men back through the jungle to the camp on the beachhead.

The captain turned back to the lieutenant. "What happened?"

"In brief," answered the lieutenant, "we reached the ridge in front of Saoeri the second day, and left the trail to cut our way through the woods. After circling around to our right front, we climbed those damn coral cliffs and started down the other side, moving back in to where we thought the left flank of the Jap perimeter should be. Pretty soon Eddie, who was point man with a native, spotted a Jap getting water from a well at the foot of the ridge. We get ready to move in and give that 'skivvy' the heave-ho when all hell breaks loose. They had a machine gun in a tree, and there must have been other guys in the other trees right over us. They started dropping grenades on top of us like they were pickin' apples in an orchard. That first Jap stands up, and Eddie knocks him into the well with one shot. About that time a grenade lands at my sergeant's feet, and he dives sideways just in time to catch a lot of splinters in mid-air. Then somebody back in the rear guard uses his head and starts launching rifle frags into the tree tops in front of us. We hear a squawk and see another Jap dive down from the top branches. A knee mortar starts working on us, and our natives 'go to the bush', after chucking our radio down the cliff where we can't get it."

The lieutenant stopped his story a moment, fished a rather damp cigarette from his jacket pocket, and continued: "About that time I figure we've found out where one flank is anyway, so we scoop up the sergeant and get the hell out of there. Sometime later, it seems like a long time later, too, we get back to the trail and throw up a perimeter of our own while the medic works on my sergeant. Eddie needed some patchin', too. Then the medic says the sergeant is in bad shape and might need a surgeon. It's a question of spending a few more hours nibbling around those Japs while Bill bleeds, or of starting for home right now. We build a litter and start for home. If you think that jungle's rough travel-in the daytime, you should try it after dark—particularly that damn swamp. We wouldn't have made it before morning if Miller and his boys hadn't come out with flashlights to meet us, after the native brought you the message. Boy," he added, "am I bushed!"

A trickle of rain began to seep across the headquarters tent floor, and a dozen or so little green bugs buzzed around the Coleman lantern.

"Okay, Lee," the CO said, "get some sleep, and you and the clerk write a detailed report first thing in the morning. I'll see G-2 tomorrow, but I don't think he's going to like it too much."

G-2 was not overjoyed; neither was G-3. Here it was July 23, 1944, the Biak operation was supposed to be history by now—according to the papers back home—and yet native reports kept coming in to division headquarters which told of organized enemy groups gathering in isolated coastal villages on the other side of the island. Fifty Japs here, fifty Japs there . . . it all added up to more trouble, since these Japs seemed to be well armed, aggressive, and in some cases well stocked with rations which had been dispersed all over the island some weeks before D Day. Then there was that Jap battalion which had not been committed during the fight for the air strips. Prisoners said it had withdrawn to the north coast of Biak, and had evacuated large quantities

AOERI

. Andrew, Jr.

Is one of the most exciting and
ut of World War II. This is the
eir fight against a Jap-infested
establishing himself as a pro-
e 41st Didn't Take Prisoners"
aturday Evening Post.

of food and ammunition to an obscure place called Saoeri. Captured documents indicated a plan whereby the defeated enemy was to rally in platoon and company groups, each with an assigned village, garden, or jungle area. By keeping hidden from air observation, living from the produce of inland gardens and hidden ration dumps, and by maintaining contact by a well organized system of runners, these Japanese troops would rendezvous in the near future and launch a last, surprise *banzai* attack to drive the Americans back into the sea.

The enemy plan was, of course, a forlorn hope. Biak was taken from the Japanese Army for good and all. But G-2 and G-3, now in their second year of fighting Japs, could see how these enemy remnants—if given the opportunity to reorganize—might some night play hob with the efficient operation of an air base. It was impossible to throw a closely knit perimeter around miles of air strips, docks, dumps, hospitals, and beach installations. And those big, shiny bombers in the dispersal bays, the great stacks of gasoline drums, and the palatial encampments of the 5th Air Force, certainly were a temptation to any raiding body of troops—particularly troops with as much fight left in them as this gang of Japs seemed to have.

Early in the game it was evident to G-2 and G-3 that the future "rendezvousing" of the scattered enemy must never be permitted. But how? Of course, you could comb the whole island with large fighting patrols, but the poor Doughs had been pushing Japs around ever since the division went after Hollandia and Aitape months ago. In that time, the division pulled four full-scale assault landings in 36 days. In short, the men were tired, many were sick, and the division was waiting for badly needed replacements. Couldn't some other means of mopping up these Nips be found?

G-2 and G-3 thought, looked at the maps and then at each other, watched a squadron of fighters circling to land on the recently captured strips, and came up with a plan. The air-liaison officer was called in.

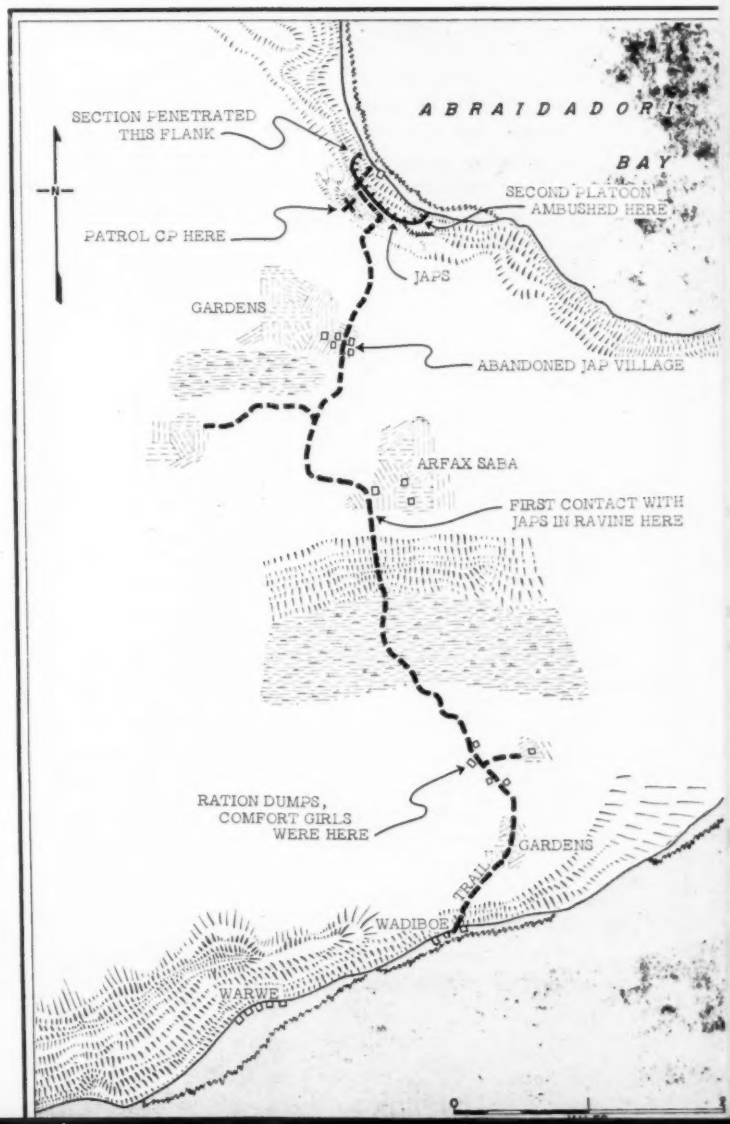
"Out there," said G-2, making a vague sweep of his arm toward the interior of the island, "are Japs. Lotsa little Japs hiding in bunches in the jungle."

Air-liaison blinked and nodded.

"If," said G-3, moving in for the kill, "if we found 'em, could your fighters bomb 'em?"

"Sure," said air-liaison.

Thus a strategy had been devised whereby reconnaissance patrols, investigating native reports, would locate the many enemy bivouacs, mark the locations on maps or air photos, then stand back while fighter-bombers encouraged the Jap troops to seek residence elsewhere. The plan was a good one. The Japs, reasoned G-2, are tired and somewhat discouraged, and they aren't eating too well. They don't like to be strafed. If they know our air force knows where to find them, they will keep moving. If they keep moving, they will become more



tired and discouraged. If they become more tired and discouraged they will stop moving rations from one spot to the next. If they stop moving rations they will starve, get weak, get sick, and die. If that happens, there will be no big *banzai* on the air base some night. Then, when we get our replacements, we can break them in on jungle fighting by letting them mop up the remnants.

It was a result of this strategy that brought the CO of the division reconnaissance troop to division headquarters the morning after his patrol had brought in their wounded. It was true, he told G-2 and G-3, that there were Japs at Saoeri, just as the natives said. They were somewhere up on the forest-covered cliffs overlooking Abraididori Bay. How many, he couldn't say, but they were apparently well armed, had grenades, maybe a knee mortar, and at least one machine gun. And because this machine gun was in a tree, it was a safe bet that there were few others on the ground. "The left flank of their position is about here," said the captain, pointing to a spot on an air photo. He could, he added, take his whole troop up and drive them out, but in those cliffs it would be tough, and he would need better supply and evacuation than it seemed possible to provide.

Again G-2 and G-3 considered. Saoeri was more rightly described as an "area," rather than a village, located on the shore of Abraididori Bay at the northeast tip of Biak Island. Behind a scimitar of palm trees that shaded the beach, and about 100 yards from the water's edge, a series of jungle-covered, coral cliffs rose in terraces reaching 200 to 300 feet above both the coast and the inland terrain. As on most of Biak, these cliffs formed a natural parapet which ringed the edge of the island, and guarded the comparatively flat, inland forest and swamps. Air photos of the area showed two native houses on the beach, and a trail which came from the interior, disappeared into the vegetation of the ridge, and reappeared again on the beach side some 200 yards or so farther to the west. Perhaps, reasoned the photo interpreters, the trail climbed the cliffs from the inland side, turned to the left and followed the top of the ridge for 200 yards, and then dropped down to the bay. "Any way," they said, "if there are Japs at Saoeri they are probably near the trail where it crosses the ridge, for we can't see anything else in these pictures.

No one had ever been to Saoeri except a few natives, and the recon patrol that was there long enough the day before to get a quick look and be ambushed. As the crow flies, Saoeri was only 10 miles from the beachhead, or six miles from the friendly native village of Wadiboe, which could be reached by truck. But American soldiers are not crows, and the trail that crossed the island from Wadiboe to Saoeri was not one to encourage Sunday afternoon strolling.

G-2 and G-3 regarded the recon captain. "Look," they said, "we don't want to start another war on the other side of the island just to chase out maybe only 50 lousy Japs. Just send another patrol to Saoeri, let them find the front and other flank of the Jap position, have them draw a circle on this air photo, and we will let the 5th Air Force lay eggs on it." And so saying they left for their afternoon swim off the reef at Bosnek.

The second patrol to Saoeri was going out loaded for bear. Upon his return to camp, the captain had summoned his most experienced platoon-leader-lieutenant away from a fast game of cribbage. "Look," he said, in the words of the staff, "leave for Saoeri tomorrow with a good strong force. Be back in three days to mark some Japs on this photo." Then he left for his swim off the reef.

The lieutenant called in his platoon sergeant. "Look," he said, "we are leaving for Saoeri tomorrow to locate those Japs on the ridge. Alert our boys, a section from the 1st Platoon, two aide men, and a squad of machine gunners. Have our operators tune up an SCR 284. Send an interpreter to Wadiboe to line up some natives to carry the radio and rations, and get three soundpower phones and a mile of combat wire. Have the non-coms report to me here."

A short time later the platoon sergeant, three section sergeants, and a machine-gun corporal were grouped around a plank table with the lieutenant. The air photo was passing from experienced hand to hand until the officer retrieved it and uncurled its edges on the table along with the not-too-accurate map of western Biak.

"As you probably know," said the lieutenant, "we are going to that place on the other side of the island where the 2d Platoon got shot up yesterday."

The noncoms nodded wisely and waited.

"According to G-2," the officer continued, "natives report at least 50 Japs and maybe more at this place called Saoeri." The lieutenant indicated the map. "Also, G-2 says there is a Jap battalion, or part of it, dispersed in groups somewhere in this part of the island. The Saoeri Japs are probably part of it. This battalion has not done much fighting, if any, since we landed, and should be in pretty good shape. Midway between this side of the island and Saoeri is a place called Arfax-Saba —which is a native garden area. Just beyond that, the Nips built a large village and recreation area. According to the best of speculation, these Japs we are after were in the rest area when we landed. But instead of coming down here to fight they are supposed to have taken all the rations and other truck from the village and withdrawn to the north coast of the island. Some of the rations are supposed to be stored at Saoeri."

Somebody was passing cigarettes and the lieutenant took one as the pack went by.

"Now," he continued, using a burnt match as a pointer, "the 2d Platoon followed a cross-island trail to about here," he pointed at the map, then circled through the jungle to the right, climbed the ridge, and ran into trouble about here." There really may not be many Japs at Saoeri, but even a few—if they're dug in and in caves—can cause a lot of trouble if you try to dig

them out. Besides, you know they probably have some machine guns."

Again the noncoms nodded, and looked even more wise.

"But!" And the lieutenant beamed, "We are not going to attack this bunch of skivvies—the air corps is—all we have to do is find exactly where they are!"

No comment from his audience, but a couple of sardonic grins were in evidence.

"Now I've got a plan, and if any of you guys have a better one, let's hear it. Tomorrow morning we will pick up some native scouts and carriers at Wadiboe, cross the island, and follow this trail to where it starts over the ridge at Saoeri. We should get there the second day, because we'll take it easy. I think that the Saoeri Japs probably have a perimeter, bivouac, or something grouped around that part of the trail. It must run along the top of the ridge before it drops down the other side to the bay. The 2d Platoon ran into trouble on the ridge not far to the right of where the trail disappears. Now, we'll leave the trail on the *left* side at the base of the ridge, and set up a small perimeter of platoon headquarters and a section in the bush. Then one section will climb the ridge directly to our front, and, if I am right, it will bump into the center of the Jap establishment. Another section will move along the base of the ridge—and parallel to where I think the trail must be on top—until the sergeant thinks he is past the point where the trail turns down to the bay. Then that section will climb the ridge to the top, turn back to the right again, and work its way down the crest until it contacts the enemy flank. We will take sound-power phones, and the two sections will lay combat wire as they go. We will have a radio to keep in touch with troop headquarters, and I will want progress reports as you go. Besides, once the wire is laid, you can follow it back down the ridge and eliminate the chance of getting lost in those weeds. Are there any questions so far?"

A short discussion ensued, the upshot of it being that the plan couldn't be so bad if no one was dumb enough to get his tail shot off in its execution. With that fine point decided, the lieutenant talked for awhile about rations, ammunition, when to be ready to leave in the morning, and finally dismissed the men.

The noncoms went off, first to talk with their men, and then to swim off the reef. The lieutenant didn't go swimming that day. He was on the field phone trying to talk division artillery into flying him over Saoeri that afternoon in an artillery liaison plane.

The morning dawned bright and dry. Before the breakfast mess kits had been rinsed, sweat had begun to appear on anyone who moved faster than an amble. One degree from the equator is not a locale for excess energy. But that was not why the patrol was late in hitting the trail from Wadiboe. The lieutenant should have known better, for he had been dealing with natives for some weeks now. The procedure was always the same.

"Tabe, Tuan," came the greeting from the first adult or child he met.

"Tabe, mana kepala?" he answered, asking for the local chief.

After an interminable period, he was passing out a cigarette to the *kepala,* and in lousy Malay was asking "whereinell" were the carriers and scouts the sergeant had yesterday made arrangements for. Eventually the required natives were gathered on the scene, and after a great deal of maneuvering among themselves for the lighter loads, plus general Neanderthal gold-bricking, the carriers were ready and the patrol got under way.

By midmorning the patrol filed out of Wadiboe, and was climbing the ridge in back of that village. If fever, foot rot, and a few casualties had not taken their toll, the patrol would have been composed of three 12-man sections of trained scouts, four machine gunners and two radio operators, two medical aide men, the lieutenant, and his platoon sergeant. As it was, the group totaled about 36 men, not counting the accompanying natives.

The men were not new at their business. Originally they had been cavalrymen—drivers, mechanics, gunners, motorcyclists, and what-have-you—of the division's mechanized reconnaissance troop. Back in 1942, when the Japs didn't get to Australia, the division went up to New Guinea to find them. At that time the troopers were deprived of their scout cars, and were reorganized and trained as dismounted scouts. In two years they had learned their new rôle, and considered themselves experts.

They were dressed mostly in camouflage herringbone twill, fatigue hats, and very light packs. Beside the machine gun, their arms were, for each, a knife, two grenades, and either a rifle, carbine, or Thompson submachine gun. Each man carried the gun he preferred, and there were as many of one as of another. Some men had brown handkerchiefs tied around their foreheads to keep the sweat out of their eyes. They all moved with the slow, relaxed step of men used to marching in the tropics. Once out of the village they stopped talking. They watched the tall treetops ahead, or the few yards they could see into the jungle on their flanks. A blind man 20 yards off of the trail might easily not have heard them pass.

As the patrol reached the top of the Wadiboe ridge and started down the rather gentle slope on the other side, a four-man scout group moved out in advance of the column—the first two men watching to the front, the other two keeping an eye to either flank. They were never out of sight of the head of the column where, with the lieutenant, a man with a BAR marched ready to give instant covering fire to this point group. At a word from the officer, a native in a pair of shorts and a dirty GI undershirt left the main body and ran to join the four men in front. He was Dimienoes, the 16-year-old son of the *kepala* of Warwe village, who had attached himself to this recon platoon ever since his first patrol with them. Dimienoes had already accounted for

one Jap with the long, pig spear he carried—and he could sense the presence of an enemy with the instinct of the native whose war-loving ancestors were feared throughout western New Guinea. He was, in short, the original jungle scout.

From the ridge, the trail wound through a lightly timbered area, crossed a ravine on a native bridge, and entered a large clearing that had formerly been a native garden. The patrol crossed the clearing without incident, after sending a four-man scout group around either edge, and filed into an expanse of that heavy, rain forest called, for good reason, jungle. For some distance, at intervals along this trail, the Japanese Army had now and again constructed large, native-type shacks. Rotting fish casks easily identified an occasional ration warehouse; another had been a bakery; a third, sitting off on a side trail, had very obviously been the quarters of a group of "comfort girls." Each house, before it was passed by the patrol, was checked for signs of any recently scavaging enemy who might have returned to the area.

Some time later, the winding trail began to descend. The men noticed that the big trees which had hemmed them in on either side were getting fewer in number until suddenly, upon rounding a bend in the track, the patrol was standing on the edge of what the natives called a *"sago"*—one of those swamps in which only the giant, fern-like sago palm will grow. As swamps in that part of the world go, this one wasn't so bad. The season was dry enough so that the area was not inundated. Instead, there was a footing of thick, sticky mud about the consistancy of the mess sergeant's chocolate pudding. It did not smell so good, though.

Many months before, the energetic Japs who had occupied the island had made a halfhearted effort to lay a corduroy footing of logs. But as time passed, frequent high water had floated most of them away, so that crossing the mile-wide area meant mostly wading through mud anywhere from shoe top to knee high in depth.

It was when the patrol had floundered about halfway into the *sago* that the point group stopped and took cover, while the native boy, Dimienoes, intently examined something in the mud surface of the trail. The lieutenant, after halting the column, moved forward.

"What's up?" he asked.

"I think we've been seen, sir," the advance corporal answered.

The officer followed the corporal's glance. There in the muck, leading in from the other side of the swamp, and then returning in the same direction was what on drier ground would have been called a set of footprints. Someone, walking steadily, had approached the spot now occupied by the point group, had stopped in his tracks, and then had retired with much longer steps. The lieutenant looked at the foot-hole in the mud and saw it was half-filled with water. Then, looking at one of his own tracks, he noticed that water was just trickling into it.

"I think," he said, after a moment, "that our friend, whoever he was, left here no longer than five minutes ago."

By way of confirming suspicions, Dimienoes added, *"Ada Nippon, Tuan."* The native had already decided it was a Jap.

"It may," said the officer, turning again to the corporal, "be just a straggler, or it may be a scout for a bunch of Japs. We'll keep on until we get out of this damned mud, and then stop for chow. Move out, but keep your eyes and ears open. I don't want to fight out in this stuff." The point moved gingerly on through the swamp, and the lieutenant signaled the rest of the patrol forward.

The remaining slog through the swamp was uneventful. Where the trail began the ascent to drier ground, the patrol halted at a sluggish little stream, threw out a small security force, and proceeded to fill canteens and break open K-ration cartons. The biscuits, as usual, were thrown away or given to the native carriers; the cheese, or meat, was eaten without enthusiasm. The platoon sergeant moved among the men, chanting his litany of "use them damn Halizone tablets in this creek water."

Nearly two hours later the patrol was working its way up and down a series of small ridges, more rightly described as embankments. The brief halt for lunch was long past, and already the men felt they had been marching without a break since midmorning. The trail had widened to a degree that permitted the equatorial sun to cut through the canopy of rain forest, which ordinarily should have shaded the way. Even though the men proceeded slowly and cautiously and followed a set of hob-nailed footprints, now and again visible, the least expenditure of energy seemed to soak their jackets with perspiration. The lieutenant halted the patrol, held up five fingers to signal a five-minute break, and sat down in the shade at the edge of the trail to wipe the sweat streaks from the lenses of a pair of GI specs. Beside him, a lackadaisical conversation was being held in an undertone.

"Damn, I wisht I was back in Portland!"

"Aw, you ain't ever had it so good. Whatcha got in Portland you can't get here?"

"Lots of things, there's. . . ."

"Yeah, and two-bits she's livin' with a shipyard worker, now."

The officer took a long pull at his canteen, and looked at the map he had unfolded on his knee. God knows where they get the information with which to make these maps, he thought. Everything along the beaches and for 2,000 yards inland mapped to the last little bush; everything else just one solid color. They ought, he thought, to print the word "UNEXPLORED" in big letters across that part of this map indicating the interior of this island, like they do on maps of the South Pole. Yeah, here are some notes down in one corner. *"CAUTION: This map was produced from aerial photo-*

graphs. Due to lack of accurate ground control, distances scaled on this map may be at variance with actual ground distances." And in small print under the scale, "*NOTE: Officers using this map will mark hereon corrections and additions which come to their attention and mail direct to The Army Engineer, Sixth U.S. Army, A.P.O. 442.*" "Sure, anything to oblige, Colonel! Corrections or additions which come to my attention . . . What a war!"

The lieutenant folded the map and signaled to the native, Dimienoes. In bastard Malay, plus much scratching of diagrams on the ground with his knife, the officer learned eventually that Arfax-Saba, the native garden area a little more than halfway on the route to Saoeri, should be no more than a few minutes march down the trail.

Arfax-Saba was one of those places along a jungle trail at which you arrive almost before you realize you are there. Years ago, no longer being able to ply their once-profitable diversion of raiding the villages of other islands, the coastal natives of Biak cleared large tracts of jungle on their inland plateau. There, communal gardens were established from which the women drew an assortment of tropical vegetables to supplement the native diet of fish, coconuts, and Dutch government rice. But since the coming of the *Amerika* to Biak, and the flight of the Japanese into the interior, few natives ventured far into the island, unless they went to hunt the Japanese—for which they were paid at the rate of one Guilder per right ear, delivered. Arfax-Saba was one of these gardens, perhaps a half-mile square, now abandoned and rapidly reverting to jungle.

The trail to Arfax-Saba did not cross this open area. Instead, it came out of the forest, and decended into a small, elbow-shaped ravine that bounded one corner of the garden. Standing at the elbow where the trail dropped into the ravine, the patrol leader was able to see to his right front the open sky over the garden, and the roofs of some shacks, for the bank of the ravine was higher on the garden side, and the clearing itself was in defilade. Directly in front of him, the trail ran along the bottom of the ravine for about 100 yards. There the ravine ended at a smaller embankment upon which was built a native shack. The trail climbed this embankment, passed to the left of the shack, and then turned abruptly to the left and away from the garden area. To his left front, the officer noticed that the bank of the ravine was not nearly so high on the left of the trail as on the right. In fact, it was only about head high, and was bordered partly by the wall of the jungle on his immediate left, and by the edge of a smaller clearing, to his left front, which was about 100 yards square. It was around the far corner of this smaller clearing that the trail turned to the left and disappeared, flanked by the jungle and the far, bush-lined edge of the clearing.

After one look at the ravine, at the high bank to its right, and the solid jungle beyond the embankment and shack at its end, a very obvious conclusion jumped through the patrol leader's mind: "Brother, what a place for an ambush." It was evident that he was not alone in his estimate. Ahead of him, about halfway up the ravine, the four-man point was advancing almost inch by inch, each man mentally selecting the log, bush, or tree behind which he was going to dive. In front of them, the scout Dimienoes had stopped; aware by instinct that something was wrong, but as yet unable to decide just what it was.

By this time, about eight men of the main body had descended into the ravine, or were making their way down the short embankment. With a low whistle, the officer halted his patrol. The point took cover immediately, and the remainder of the men in the ravine prepared to do likewise, if necessary, As yet, there had been no sign of anything amiss, but then there usually never was.

Two men from the head of his column and the patrol leader worked cautiously up to the high embankment to the right of the trail until they reached a point where they could observe the wide expanse of the garden of Arfax-Saba. All that could be seen was a tangled mass of weeds, dotted here and there with huts built on stilts, all in a state of general disrepair. The lieutenant was crouched on one knee, his back to the ravine with its trail. He was carefully watching the area for any sign of life. To his left, a few yards away, Private Arnett Putnam, a hefty, ex-combat engineer, was similarly engaged, while at the lieutenant's right, Private "Bunny" Barber, a 19-year-old ex-schoolboy, was looking the opposite direction, watching the terrain on the other side of the ravine.

"Hey, Lieutenant!!!" Barber's stage whisper might have wakened a corpse. He was gesturing across the ravine to his right, where—when viewed from the elbow of the ravine the trail had previously been seen turning away from Arfax-Saba—but where now some 50 yards of it was plainly visible, partly through the bushes which bordered the smaller clearing. Down the trail, marching in file as to a picnic and obviously unaware of the presence of the patrol, came three Japanese soldiers.

"Hey, Put!" stagewhispered the lieutenant, glancing away from the oncoming Japs, and trying to outwhisper Barber in order to alert Putnam. Putnam turned and he pointed. As he did so he saw the Japs, who now were running back up the trail. Raising his carbine, he suddenly discovered how hard it could be to get a running target into the aperture of that little rear sight. He fired anyway. Next to him he could hear the crack of Barber's carbine, and the rapid, reassuring bark of Putnam's M1. Jeez! All three Japs were still running! But by now they were nearing a few bushes. This, thought the officer, will be like firing at ducks in a shooting gallery. And so, he aimed at a bush in front of a Jap, and as the man disappeared behind the vegetation, the lieutenant fired a round, not at all like he'd been training his men to shoot. Almost simultaneously, Putnam's M1 barked again. The Jap, who had disappeared behind the bush

at a dead run, popped into view on the other side, hit face down on the trail and lay still.

As the Jap fell dead on the trail, eight other Japanese riflemen rose from a hollow behind the shack at the head of the ravine, and disappeared into the jungle without firing a shot. Only Putnam saw them go, and he, between curses, was frantically stuffing a new clip into the magazine of his rifle.

Some hours later, the lieutenant stretched himself out on his poncho, took a drag on a cigarette cupped carefully in the palm of his hand, and hoped that the last edges of daylight would stay with him long enough for him to finish the butt before dark. The patrol, now a mile and a half beyond Arfax-Saba, had pulled off the trail an hour before nightfall, and he had established a small perimeter on a knoll in the forest. The platoon was deployed, three men to a group, each group behind what hasty log breastwork it had found time to construct, and each within almost spitting distance of others on their flanks. The tight little circle enclosed a small patch of jungle wherein were settled the natives, the aide men, and the platoon headquarters group. Those damned natives, thought the lieutenant, were making too much noise. They always did. Although he was positive that the patrol had slipped off the main trail unobserved, he was always nervous just at dusk and dawn. If nothing happened before it was dark, he was sure the platoon would be unmolested by any wandering Japs. Anyway, the machine gun and his three BAR's were well placed.

He snuffed out his cigarette, started smearing mosquito dope on his hands and face, and mentally reviewed the events of the afternoon. At Arfax-Saba, when he fired the first shot, the platoon had automatically deployed under the watchful eye of Sergeant Miller. But it was unnecessary. The whole affair had been over in less than a minute. The Japs had faded into the bush, leaving their dead sergeant on the trail. He had sent a small force up the trail after the two that ran that way, advanced the platoon through or around the ravine, and halted to search the corpse. He had wasted a lot of time setting up the radio and trying to notify troop headquarters of the enemy contact, but had discovered that the radio wasn't working—as usual. The native carriers had probably dropped it too hard when the shooting started. After a thorough search, the lining of the dead Jap's hat had given up a brass dog tag and, more important, a crude pencil sketch of what might be the Jap position at Saoeri. He had immediately started four men back to camp with this find and a report. He couldn't spare four men, but you couldn't send fewer through an area well-known to the enemy, and you couldn't trust a native to get beyond his wife in Wadiboe before morning.

After packing up the radio, they had started down the trail again, and had rejoined his advance party at a trail junction a half hour later. The two fleeing Japs had been joined by others, according to the footprints, probably the group Putnam had seen pulling out from behind the shack. Some of them had taken the trail to Saoeri, and some had gone down the branch trail which led off further to the left. He had sent a party to follow them for a short way, and the group had been too long in returning to report another garden area some distance down the trail, but no further sign of the Japs. Before the whole patrol had again assembled and resumed the march toward Saoeri, a lot of time had been wasted, and it was getting late. They had gone only a short way before it was time to start looking for a bivouac. By this time, the canteens had only a little water left in them, and he kept hoping to find a stream. At length, they were all forced to make camp without refilling the canteens. They had crossed only one stream all day—the one at the swamp—which was rather unusual in that climate.

The officer wiggled his stockinged feet, leaned back, and propped his shoes under his head. "Miller," in a low voice he spoke to the sergeant stretched out at his side, "did you notice anything about that Jap we knocked off this afternoon?"

"Sure, Lieutenant, he was the biggest bastard I have ever seen wearing a Jap uniform," came the reply. "Jeez, he must have been over six feet."

"Anything else?"

"Yeah. That guy was healthy, and he was well fed. When we pulled his shirt up to search him, I noticed a roll of fat on his belly. Even if he was a 'sargint,' that's unusual for Japs on this island nowadays. Furthermore, his rifle was clean, oiled, and no rust, and his clothes were in better condition than mine. Lieutenant, that guy hasn't seen any action in this war since he left China."

There was no doubt about it. The Japs they had run into that day were from the missing battalion; the one that had withdrawn to the north coast of Biak early in the fight for the island. The lieutenant tried to reconstruct the probabilities. After the 2d Platoon had pulled the patrol to Saoeri, the Japs there had probably taken steps to prevent another Yank patrol from arriving unannounced. They probably had sent a security force down the trail into the interior of the island, or else they were growing short of rations, and were sending foraging parties out to the native gardens. At any rate: 1. a party of Nips was at Arfax-Saba today, 2. it had sent a scout along the trail toward the swamp, and 3. it had learned of the approach of his patrol. An ambush—and a lousy one at that—had been prepared at Arfax-Saba. Why the Japs had not spread out along the high edge of the ravine, he would never know. Instead, they were hiding in a depression at the head of the ravine, waiting, he guessed, to give the patrol hell when everyone got into the gulch.

But why the three Japs marching down the trail? The only way he could figure it, the three had left their main group earlier in the day, and had returned at a most inopportune time. They were walking down the

trail as if they owned it. In the few seconds he had been trying to get Putnam's attention, the three Japs must have received a signal from their hidden comrades, and taken off up the trail at a dead run. Anyway, the fat was in the proverbial fire now, because all except the dead Jap sergeant had gotten away. Their main body at Saoeri were wised-up by this time. Well, it was dark now, and there was not much chance of trouble before morning anyway. The lieutenant began to relax a little.

When he awoke, it was already well past dawn, and the platoon was eating its K-ration breakfast. As usual, the platoon sergeant had refused to awaken him—a fact for which he was secretly grateful. S/Sgt. Donald Miller, tow-headed and belligerant, from Wyoming, was younger than most of the men in his platoon. Known affectionately as "Stinky" by "them boys," he could make them jump through hoops by the lash of his good-natured ridicule, and the sheer weight of his personality. Although the sergeant never knew it, his platoon leader regarded him with all the affection of a brother. They had occupied the same hole together. They had drunk the same bottle of captured *sake* together. In short, they had grown up in the whole damned war together.

"Lieutenant, we've found some water," was the platoon sergeant's good morning.

"Where?"

"Over there, sir."

In an adjacent group of trees, a half-dozen men, under the guidance of two natives, were cutting leg-thick vines away from the trees. After cutting a vine loose, they would hack a point on the loose end. From this point a thin trickle of water would run into the canteen held beneath it. The lieutenant collected a half-cup full, and prepared the breakfast Nescafe.

Nearly an hour later the patrol was halted on the Saoeri trail at the edge of another garden clearing, which to all appearances was much larger than Arfax-Saba. Ahead of them the advance guard, reinforced by flanking groups, was feeling its way through light vegetation toward a group of the largest native-type shacks the lieutenant had yet seen on Biak. These shacks, sitting across the trail where it ran along the edge of the clearing, were evidently the abandoned enemy village that had once been the rest area of the original Biak garrison force. Each shack, large enough to house a company of Japanese infantry, was situated on its own knoll, which rose out of the bumpy terrain. And around each shack, the former occupants had dug a perimeter of foxholes, as if they had once anticipated defending each of the leaf-thatched barracks buildings. Orderly pathways led from building to building, blazed tree trunks were marked with Japanese lettering, and at the edge of the main trail, in front of one house that must have been a headquarters, a huge shinto gate towered above the entranceway. The whole area, as the advance party discovered, was deserted. It had been abandoned with an efficiency that had left behind only a few empty bottles and a broken sack of rotting rice. The platoon filed down a slope into the village, and halted in column on the trail. The lieutenant had reasoned that a village of this size would have been built near water. Four men, sent to reconnoiter a near-by hollow, confirmed his estimate.

A water detail, having collected the canteens, set off down the gully for the water point. The remainder of the patrol settled along the trailside for a smoke. The lieutenant had just lighted a cigarette when the radioman next to him jumped to his feet.

"Hey, Lieutenant!" He pointed toward the rear of the column. Just below the crest of the slope where the trail dipped out of the forest and into the clearing, a trooper was frantically pumping his rifle up and down over his head, signaling "enemy in sight!"

Most of the platoon had also seen. Already men were throwing their packs beside the trail, checking their weapons, and looking to him for directions. The officer ran stooped-over down the trail toward the rear. Midway through the village a small, black snake wriggled across the path in front of him, and disappeared in some brushwood. Later, he had time to remember that it was only the second snake he had seen in two whole years in the tropics. The other had been in his bed a year ago in Papua.

Before he had reached the rear guard, a tommy gun began to fire. It was quickly joined by a BAR, then a chorus of rifle fire. It stopped as suddenly as it had started, while an angry voice yelled, "You trigger-happy rummie! Next time you wait until I say to shoot!"

"But Sarge, I thought they had seen us and were starting to run."

"Listen, damn it, even a Jap can stop to scratch his tail. They would have walked right into us, but now look."

The lieutenant, arriving on the scene, also looked down the trail to where a Japanese soldier sprawled 75 yards away. Three rifles were scattered near him.

"There were three Japs, Lieutenant," the section sergeant explained. "They were following our tracks. We wounded the other two. They're in the bush somewhere. I don't think there were any others behind them, but we'll never know now." The sergeant glared at the man who had fired prematurely.

The officer signaled back to a section, brought them up, and started them cautiously combing the jungle on the side of the trail. They found nothing. Off in the distance he could hear a roar not unlike that of an approaching subway train. He called in the section and started back to the village. The rumbling sound grew louder as the heavy raindrops smacked onto the upper vegetation of the jungle. Within two minutes, while the lieutenant was giving a brief resume of the situation to his other sergeants, the rain rolled over them in an avalanche of water.

A half hour later, the rest of the patrol was feeling its way along the last, muddy mile of trail toward Saoeri.

The tropical shower had passed on as swiftly as it had arrived, and already the sun was drying the clothing on their backs. The officer, now somewhat worried at the delays encountered since leaving the swamp the day before, had decided to push ahead with the better portion of his three reconnaissance sections. The natives, and the operators with their doubtful radio, had been left behind at the village under the protection of the machine-gun squad and a half section of scouts. They had taken a defensive position on a knoll in the clearing, making use of one of the shacks, and the foxholes conveniently dug by the last occupants.

The patrol, now at a strength of about 25 men, was moving all the more cautiously along the trail. The terrain, slightly rolling, was again hidden under the same thick rain forest they had encountered most of the way across the island. The men were not marching. The point group was moving ahead slowly by bounds, searching the trail and vegetation around every bend, and only then signaling the main body forward. After an hour, the lieutenant knew he was drawing close to the inland slope of the Saoeri ridge. He had passed the cut brush at the point where the 2d Platoon had left the trail a few days before to work around the left flank of the enemy position on the ridge.

The lieutenant moved up and joined the point. As they climbed a short rise, the vegetation thinned before them, the trail turned out of sight, and a great bulk of trees and matted vegetation rose in tiers across an open space in front of them. The point man stopped, sniffed the air, and motioned to his platoon leader. The officer moved forward, joined his trooper behind a clump of brush, and peeked through the leaves. The trail wound across the clearing for about 50 yards, started up with a sharp angle at the foot of the first terrace, and disappeared again in the mass of vegetation covering the cliffs.

"Smell 'em?" the trooper whispered.

The lieutenant sniffed. There was no doubt about it. Anyone who had ever smelled that mixture of what stunk like pomade and unwashed carcass would know.

"Let's go back," came the order. Undoubtedly, there was an outpost at the far side of the clearing, covering the approach to the ridge.

The patrol backtracked silently down the trail. After retracing their steps for some 75 yards, a slight break in the bushes, found by Dimienoes, revealed itself as a narrow pathway leading off through the forest to the left of the patrol's original direction of advance toward the ridge.

The patrol filed off the Saoeri trail, worked its way into the jungle along the path, and halted on the edge of a slight hollow around which the pathway continued. As well as he could, the lieutenant estimated that he was now about 100 yards west of the main trail, and another 100 yards from the base of the ridge. He called the sergeants of the two reconnaissance sections forward, gave them instructions, and disposed the remaining half section around the edge of the depression to form a very thin perimeter. A BAR was set to cover the path where it led into them from the main trail.

The platoon sergeant was tying the loose ends of two reels of Signal Corps combat wire to a sapling in the center of the perimeter. To these ends he clamped a sound-power telephone. He handed a reel each to two men who began to unwind the wire as they followed their respective sections.

The two reconnaissance sections, averaging now from 10 to 12 men each, some of which carried additional reels of wire were already beginning to push their way through the vegetation. In no time they had disappeared, leaving only the thin strand of wire leading into the shadow of the forest. The lieutenant unslung his pack and sat down, the phone pressed to his ear as he waited for the first progress report from his section sergeants.

Some hours later, the lieutenant was still sitting. He was no longer listening at the phone, and he was not at all happy. Both of his scouting parties had run out of wire long ago, and he could only guess what was happening. The ridge was apparently rougher than anyone had known. It was a series of cliff-faced, knife-edge ridges of coral, each one rising higher than the one before until the aggregate formed a most formidable escarpment. Apparently, his men had been laying more wire up and down than they had unreeled in any horizontal direction. His sergeants had been emphatic in their phoned reports. "We're doing fair, Lieutenant. Worst damn terrain I ever saw, though." There had been no sign of the top, however, before they had run out of wire. To add to his troubles, a small party of Japs had been heard passing along the trail about an hour and a half ago. They had evidently been returning from inland to their present bivouac up on the ridge, and no doubt had scouted his natives and the few men he had left back at the village in the clearing. Most likely, they were the rest of the group first encountered at Arfax-Saba. Now that his patrol was split into four groups, the Japs, if they were smart, could come out of their ridge and try to deal with the patrol. "If I were the Jap commander," he thought, "I would hit that group in the village about dusk, and get their rations, radio, and machine gun."

He debated a long time. He could continue the scouting operation until dark, have everyone stand fast where they were through the night, and complete the job in the morning. This would leave the small group in the village by themselves, where they might have to fight off a sortie of Japs from the ridge. Or, he could order his scouting parties to return before dark, retire in full strength to the village, then get an early start in the morning and spend as much of the whole day as needed to scout the position on the ridge. This, however, might make him a day late in returning to camp, and they were running short of rations. He wished his unspeakable radio was working. Well, the patrol would have to

go hungry. He'd make up his mind. Thus when each of his sergeants had phoned in their last report, he told them to make plans for returning to his position at least an hour before dark, if they had not located the enemy position in time to return with the day's work completed.

Now it was almost time for the recon sections to be returning back down the trails of wire they had been laying through the dismal vegetation. Dimienoes was sent out along one wire line to see if there were sight or sound of men coming back down the ridge. In 20 minutes Dimienoes was back; with him was the group that had started straight up the ridge in an attempt to contact the center of the Jap perimeter.

The section sergeant dropped next to his platoon leader, took the cigarette that was offered, and sighed. "Lieutenant," he said after lighting it, "I have never seen the like. That ridge is a mass of roots, coral boulders big as a house, pinnacles and crevasses even bigger, and one vertical climb after another. It's up, then down, then up a little higher, then down a little farther, and all the time you can't see your hand in front of your face, there's so much greenery growin' around. About an hour after I called you the last time, we got to the top of the highest ridge, with still no sign of Japs or the trail that you thought ran along there. Anyway, we started down the other side, with the same results, but we couldn't go very far before it was time to start back." The sergeant took a long drag on his cigarette, thought a moment, then continued, "About that trail, sir, it's our guess that it must cross the top of the ridge and go part way down the other side before it turns to the left. It must run along the reverse slope up there. Anyway, it's not on the top and neither are the Japs."

The sergeant's explanation seemed logical. The officer looked at his watch. It was time the other section was returning. It was not much more than an hour before dusk now.

A sudden burst of firing from up on the ridge broke the late afternoon silence. The officer jumped to his feet. Miller, the platoon sergeant, came scrambling through the jungle underbrush to the platoon leader's side. The firing had started first with a burst from a tommy gun, then about three quick rounds of what might have been an M1, then silence.

"Miller, what do you think?"

"Them's our boys, Lieutenant."

"Yeah, but what the hell they doing up there? They should be back here by this time."

"Don't look like they're gettin' here tonight, Lieutenant. Sure hope they ain't gettin' into trouble."

"Tip," the officer turned to his other section sergeant, "if those boys started back here right now, how long do you think it would take them, if all that ridge is like what you were on?"

"Two hours—maybe three, sir."

"Hell, it will be dark in less than an hour!"

"Yessir."

"Could anyone move on that ridge in the dark?"

"Nossir."

The lieutenant looked at his watch again. "We can wait only 20 minutes more," he said. They waited. After a quarter of an hour had dragged by, the shooting began again up on the ridge. It started with a single rifle shot, then another and another, ending in a climax of rapid fire. The officer had counted about 20 rounds.

"Well, Miller?"

"Them wasn't our boys that time, Lieutenant." Then earnestly, "I hope to devil that Abner knows what he's doing up there."

"Did one of the medics go with him?"

"Yes sir, Rabinowitz."

"Good."

"What do we do now, Lieutenant?"

The platoon leader exhaled slowly through clenched teeth. "We get this outfit back to the village before dark. We dig in for the night. At daylight tomorrow everyone must be ready to go to Saoeri—hoping that they meet one complete section coming back down that damn ridge."

Already the shadows were getting thicker along the ground, and the heat of day was beginning to fade. The bulk of the Saoeri ridge could be felt, rather than seen, towering above the trees that surround the patrol. The men were beginning to move back toward the trail. As the lieutenant reached down to pick up his carbine, he had the feeling of having just murdered his brother.

The night that followed was perhaps the longest the platoon leader had ever endured. There was no enemy sortie upon the village, a possibility that ceased to worry the officer once he had established the balance of his platoon in one of the old Jap positions. It did not rain; the officer could find no fault with the weather. But he had not slept much, having spent most of the night lying awake in his poncho wondering what had happened to his section up on the Saoeri ridge. Apparently, they had found the Jap position, but then what? Had there been any casualties? If so, how many? Who? The Japs had done a lot shooting in that last, brief engagement. Was the section cut off up there on the ridge; surrounded by dirty little skivvies waiting only 'til daylight to close in on them? Why in hell hadn't the sergeant come back when he had been told to? So, it was with a mixture of relief and impatience that he had watched daylight begin to filter through the heavy forest and across the gardens.

The patrol had been on the trail back to Saoeri for 20 minutes now. The lieutenant was pushing his men forward as fast as he dared, and although they did not anticipate trouble, the point group had watched a dog come down the trail, stare at them a moment, and then turn back down the trail at a fast trot. It might have been a stray, and then again it might have been accompanying another enemy party. Now, thought the lieutenant, would be bad time to be ambushed. The patrol was winding up a slight hill. The lieutenant recalled that

on the far side the trail dropped into a little valley, fairly open, which it crossed only to disappear over the next rise in the rolling terrain. The officer was watching his point group as it reached the crest of the hill. Almost with one motion the four men took cover in the brush at either side of the trail. Then after a moment, one man stood up, looked again into the valley, then shouted as he waved the platoon leader forward. The officer joined his point at a dead run, and looked into the hollow beyond. Coming over the crest of the far side, and down into the little valley, were the men he had prepared to count as lost, somewhere on the ridge at Saoeri.

Ten minutes later Sergeant Charles Mann, section leader, ex-barkeep, and known as "Abner" to his buddies, was seated beside the trail with his platoon leader. His left arm was bandaged near the shoulder, and a patch on his chest showed where the same bullet, after passing through his biceps, had creased its way across the flesh under his jacket pocket. So relieved was the lieutenant to find this the only casualty, that he had forgotten his plans to bawl out the sergeant for not returning the evening before. The platoon leader and his sergeant were bent over a rather crumpled air photo the officer had fished from the bottom of his pack.

"We reached the top of the ridge about here, Lieutenant" . . . the sergeant pointed to the photo . . . "about mid-afternoon, not long after we ran out of wire. We tried to turn left and move along the top of the ridge like you said, but the going was so rough that we dropped down the far side—a little better than halfway down. Then we hit this place where a lot of jungle had been cleared. Not the big trees, just the underbrush along a sort of terrace. We turned left and moved along that about 200 yards, I guess, and damn if we didn't come onto the trail where it comes down off the ridge to the beach on the other side. Well, we started sneaking up the trail, and we got to where we could see a big shack on the side of the ridge. From what I could figure, we were right in the middle of the Jap perimeter, if you want to call it that. Just then, a big Jap started down the trail with a towel over his arm, going for a swim, I guess. Anyway, he came so fast we had to shoot him, and then things started to happen.

"We pulled off the trail, and started back parallel to the ridge top again, when we ran into the back of their flank positions. Everybody started shooting at us then, so we turned around, ran back into the perimeter, down the trail toward the beach, and sneaked out the way we came in. We were able to make it back over the ridge, and found the end of our wire just before dark. We took most of the night following that wire down to where we left you, spent the rest of the night there, and started back at daylight."

The sergeant stopped, flexed his wounded arm gingerly, then added, "We would have been back before dark yesterday, Lieutenant, except we kept thinking that just a few minutes and we'd be finding their flank positions. But when we did, it was already too late and we were kinda busy."

The lieutenant looked at his sergeant, started to say something, then changed his mind. Finally, he said, "Can you pick out the flank on this photo?"

"Yes sir," grinned the sergeant, pointing, "right about there, nearly 100 yards west of the trail where you can see it going down to the beach."

"In that case," the lieutenant sighed, "let's get the hell outta here."

Two days later, shortly after dawn, 12 fighter-bombers skimmed over Abraididori Bay, circled in the air over Saoeri, then one after the other dove toward the ridge at a point where a trail could be seen leading out of the trees and down to the beach. When their bombs were expended, the aircraft circled over the bay, not unlike a huge merry-go-round, each plane dipping to strafe as it passed the column of dust and smoke that still rose from under the treetops shading the Saoeri ridge.

Five days after the air strike, a troop clerk sitting in a headquarters tent wrote in the troop diary: "August 2d: The third patrol to Saoeri returned to camp. The patrol had seen only one Jap, and he was killed by a native guide. No sign of the enemy was found in the Saoeri area. Natives have brought in a report that there are Japs living at a garden near. . . ."

Over in a corner of the tent the troop commander was on the field telephone talking to G-2. At a table, another lieutenant and his sergeants were looking at another air photo.

"Now, some natives report . . .," the lieutenant began.

Outside, it had started to rain again.

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The Nazis Were Winning the Battle of the Atlantic - - Then - -

Sonar Beat the Sub

NEITHER the Axis powers nor the Allies were prepared for extensive submarine warfare when World War II began. The Germans had about 20 500-ton and 10 750-ton ocean-going U-boats. The British had fitted their "ASDIC" (British word for sonar) on 165 destroyers, 34 small patrol craft and 20 trawlers, and the United States had about 60 destroyers fitted with echo ranging sonar.

The underlying principle of ranging sonar is the principle of the echo. Sound waves are sent through the water, and are echoed back to the sender when they strike an underwater object.

Sonar had progressed remarkably from 1918 to 1939. The capability of the World War I listening apparatus was limited to indicating the presence and general area of moving U-boats. At the beginning of World War II, we had ships equipped with sonar capable of detecting U-boats that were surfaced, submerged, underway or lying still. We also could tell their bearing, distance, and almost exact location.

When the United States indicated its intention of making common cause with the Allies, the exchange of scientific knowledge was resumed between this country and Britain.

The first year of World War II was a typical blitzkrieg. The Norway invasion in April, 1940, provided more U-boat bases, and Italy brought about 100 submarines into the war, of which 60 were ocean-going. The use of French ports, starting in July, 1940, extended the U-boat's westward range. The spotting of approaching convoys by French-based aircraft compelled Allied ships to take longer routes north of England. The obvious preparations for invading England during August, 1940, forced British antisubmarine ships to guard the coasts of the British Isles. This diversion of asdic-equipped escorts from convoy duty resulted in U-boats reaching their highest effectiveness —each sinking about 10 ships a month.

In 1941, the British captured the U-570, one of the only two U-boats taken during the war. It proved to be a valuable source of information. Its sound equipment included an underwater telegraph system containing a pair of small transducers mounted flush with the U-boat's skin. The German submarine also carried a long-range listening device containing an array of 24 three-inch diameter microphones on each bow which were fed through a phasing network to an amplifier and earphones. It was not accurate enough to fire torpedoes by, but convoys could be heard about 10 miles away under good water conditions.

When the United States entered the war, the Navy's 170 destroyers were the only United States surface craft fitted with echo ranging sonar. Three-quarters of them were engaged in cross-Atlantic convoying, the others were employed in the Pacific. Our unescorted Atlantic seaboard shipping was slaughtered at the rate of 75 ships a month by an average of 38 U-boats, of which we killed about three a month. Many of these sinkings occurred within sight of our coasts. The 75 Japanese submarines were sinking 10 ships a month in the Far East.

Meanwhile, the Bureau of Ships was equipping all available torpedo boats, sub chasers, motorboats and yachts with lightweight sonar. Production facilities were greatly expanded. The British lease-loaned us 10 Corvettes, having first trained our crews in England to use the asdic, and we obtained 24 asdic-fitted, small patrol craft from Canada. By March 1942, coastal convoying was begun with a small number of ships and land-based planes.

During this period U-boats were sinking ships faster than we replaced them, and we were losing the Battle of the Atlantic. Our success in attacking submarines after we detected them was less than five per cent—95 out of 100 got away. Sonar was detecting the U-boats, but in the crucial moments of the attacks, something was inadequate.

To find the solution, we adopted the best known methods of convoying, asdic screening and searching, and our attack successes increased.

The engineering groups enlisted the aid of additional manufacturers and furnished a gyro-controlled device to keep the sonar beam directed on the U-boat during an escort's maneuvers or turns, an electronic scope to indicate visually whether the sonar beam tended to lose contact due to the operator moving the beam either to the right or left of the U-boat, and a control device which reduced the heavy reverberations resulting from sudden sonar "pings" which cause the surrounding water to act like an empty hall with bad acoustics. The control device also reduced undesirable interfering echoes from seaweed, shallow water bottoms, tidal currents and ships wakes.

The effectiveness of the improved Allied antisubmarine measures was demonstrated when history's greatest invasion armada of about 1,065 vessels made passage in November 1942 from United States and United King-

dom ports for the coast of North Africa. Although some 40 U-boats were lying in wait, they sank only 23 ships during November. Gross Admiral Doenitz observed, "The surprise Anglo-American landings in North Africa called for a concentration of U-boats on both sides of Gibraltar. Every U-boat that could reach these waters within 10 days was mustered. Defense in these African waters was very effective—and U-boat losses were correspondingly high."

During 1942 some 1,573 ships were sunk. The average was 131 a month. The Germans kept an average of about 80 U-boats at sea out of their pool of about 360. The sonar-asdic-fitted escorts totaled about 800 ocean-going types. Eighty-two U-boats, 20 Italian and 16 Japanese submarines had been sunk, an average of 10 a month.

Early in 1943 the general locality of surfaced U-boats which transmitted reconnaissance data by radio signals was detected from long distances by high-frequency radio direction finders installed ashore and in escort vessels. The U-boat localities were then searched by land-based and escort carrier planes equipped with radar, which became increasingly effective since U-boat radar intercept receivers were unable to detect the short waves employed. Radar contact was lost once the U-boat submerged, which required about 40 seconds. Planes then parachuted floating expendable radio-sono buoys. Their suspended underwater sonar hydrophones could detect U-boat noises which activated the buoy's radio transmitter. Such transmissions, when received in the planes or near-by escort vessels, indicated the U-boat's area which was then swept by sonar-asdic-fitted escort ships for accurate location and attack.

In the early summer of 1943 an average of 120 U-boats were operating in the Atlantic. U-boat packs were frequently outnumbering the escorts by two to one. Two convoys traveling close together were attacked by about 40 U-boats which sank 20 ships. Another convoy of 33 ships protected by eight escorts was attacked by a pack of about 20 U-boats, which sank 12 ships during the midnight hour. The same pack re-attacked the next night, but none of the remaining 21 ships was lost. Twenty-four individual U-boat attacks were frustrated, and at least five U-boats were sunk. The escorts had been augmented by a score of newly built destroyer escorts and a dozen escort carriers. The carrier planes were sinking U-boats and frustrating their attacks by forcing them to submerge. Allied aircraft patrols also commenced 24-hour daily coverage over the Bay of Biscay. This intensified transit to and from their French bases and decreased the time they could remain at sea. During May, June and July we sank 108 U-boats. The crisis, or turning point, in the "Battle of the Atlantic" had been reached.

A Tenth Fleet and British Anti-U-boat Division analysis of methods in the summer of 1943 resulted in increasing the size of convoys from 40 or 50 ships to about 90 vessels without increasing the number of escorts because their effectiveness was increasing. Plane-ship coördination attacks also were improving. Towed "foxers," or underwater noise makers, attracted acoustic homing torpedoes away from ship's propellers. Faster-sinking, stern-dropped 300-pound depth charges reduced critical seconds of sinking time during which U-boats took evasive action. "Hedgehogs" and "Mousetraps," mounted on the forecastles of escort ships further reduced blind time by projecting a pattern of 30-pound charges several hundred feet ahead which upon striking the water covered a large circular area and exploded only upon contacting the U-boat.

The accumulated instruments which appended the sonar had been incorporated into the "console sonar" which contained new features. They included devices for detection of mine fields, calculation of U-boat depths with the echo-sounder, indication of oncoming torpedoes traveling as fast as 40 miles per hour, and accessories which indicated to accurate ranges, bearings and time to fire weapons. Unescorted fast ships were being fitted with hydrophone torpedo detectors. One merchantman detected an oncoming torpedo, avoided it by turning the ship, then rammed and sank the U-boat.

Only 598 Allied ships were sunk in 1943, while 219 U-boats, 22 Italian and 22 Japanese submarines were sunk, an average of 22 a month. During the winter of 1943-44, the average of 60 U-boats at sea took extreme care to avoid detection and operated mostly submerged, but detection by asdic-sonar was becoming increasingly effective, and we began sinking more U-boats than they sank ships. By April, 1944, the Battle of the Atlantic had been decisively won. Our scientists had shouldered detection problems as their contribution to the enormous Navy effort.

When the Allies invaded the Normandy beaches on June 6, 1944, the invasion waves were led by small naval scout craft equipped with an echo-ranging asdic whose recorder traced the outlines of the beaches. Mines, fencing and other obstacles were detected and blasted from the path of landing craft. The invasion forces were blanketed by heavy air coverage and a sonar screen so tight that no ships were lost to submarines until the end of June when the seven ships they sank cost them 21 U-boats.

Up to this stage of the war the U-boat had acted as a submersible torpedo boat, spending much time surfaced where it was visible by eye and radar and audible to radio interception and radio direction finders. Nazi submarine tactics, however, were revolutionized in the summer of 1944 when U-boats were equipped with the Schnorchel extension stack, which expelled diesel exhaust and drew in fresh air. The Schnorchel stack was about the same height as the periscope, and permitted operation on batteries at periscope depth which previously required complete surfacing, and six-knot speeds at submerged periscope depth instead of about three-knot speeds formerly employed to conserve batteries. The U-boats took up stalking positions at focal points of

convoy routes, from where they attacked by blindly firing acoustic and looping torpedoes into passing convoys. Periodically they came to Schnorchel depth to replenish air and re-charge batteries. Admiral Doenitz said, "The strain on crews who remained submerged as long as 70 days was surprising light."

The top of the Schnorchel stack contained an intake-exhaust valve which measured about one and one-half by three feet. This valve and the periscope were the only usual exposures above water while the U-boat operated at Schnorchel depth. The valve was covered with anti-radar material to make it practically invisible to radar. Visual detection range on the Schnorchel was only about a mile or two in daytime and practically nil at night. The U-boats also literally maintained radio silence to deprive the Allies of radio direction finder detection. The Schnorchel had effectively neutralized our antisubmarine air offensive and defeated our surface detection. But—whether Schnorchelling, submerged or bottomed—the asdic-sonar teams continued to detect and locate the U-boats.

During the winter of 1944-45 an average of 40 "continually submerged" U-boats and scores of submersible midget submarines were concentrated in the English Channel area against the bridge of ships carrying re-enforcements to hard-pressed Allied land forces fighting the Battle of the Bulge. Their operations during the last four months of the European war resulted in the sinking of only 56 ships while 88 U-boats and about 100 midget submarines were sunk. The submerged Nazis had been swept out by "Killer Group" escort ships equipped with asdic-sonar, which the Allies had developed to the stage where crevices and rocks of the ocean bottom no longer afforded safe hiding for U-boats.

About 50 U-boats which were operating in the Atlantic surrendered after VE Day and several score more were taken in ports. The Battle of the Atlantic had its finale when some 110 U-boats were carried out to sea and sunk in deep water.

The Japanese at this time had about 70 ocean-going submarines which they primarily employed to supply hard-pressed bases. Their speed of 22 knots surfaced and eight knots submerged compared favorably with submarines of other nations. They were pursued relentlessly by Allied antisubmarine groups and by our own submarines. During 1945, 26 Japanese submarines were sunk; only one Allied ship was lost to submarines between VE and VJ Days. Forty-three Japanese submarines were taken after VJ Day; others were scuttled.

The 72 months of war cost the Allies 4,773 merchant ships representing 21,141,000 gross tons of shipping sunk by enemy action. A total of 996 Axis submarines were sunk, and 221 large and scores of midget submarines were captured after enemy capitulations. The British received credit for sinking 70 per cent of the enemy submarines and the United States credit for 30 per cent.

In the last days of the war the Germans developed their submersibles into true submarines, which, according to Gross Admiral Doenitz, "with its great range of 22,000 miles was capable of scouring all waters of importance for the U-boat war without having to surface." The German designers claimed outstandingly submerged speeds of 24 knots. Allied opinion is that, "it can outdistance and probably shake off any of our present escorts who attack it." Such submarines, plus homing torpedoes, may be with us for the rest of history. They can be built in secret, and are certain to be used by the smaller naval powers.

We barely won a war against the submarines. The enemy attributed our victory to "superiority in the field of science." For the future, Secretary of the Navy James Forrestal has warned "that a military research program literally may be the price of survival."

ALL-AMERICAN TEAM

General Jacob L. Devers, Commanding General of the Army Ground Forces, made the following statement in one of his speeches given before an American Legion convention in Washington, D. C. recently:

"Out of another recent conference, at the Armored School at Fort Knox, Kentucky, came a decision to combine the Armored Force and the Cavalry, and that arm of the Ground Forces will henceforth be known as the Armored Cavalry. That gives us a triangular ground force team—Infantry, Armored Cavalry and Artillery—an All-American line-up."

U. S. CONSTAB

*by Major General Ernest N. Harmon**

Established to insure the success of the American occupation in Germany, the United States Zone Constabulary is a special force employed to provide adequate support for police, government, and intelligence agencies in the United States occupation area.

THE United States Zone Constabulary was organized for the specific purpose of insuring the success of our occupation of Germany. It is an "occupational force of lightly armored, heavily armed, mobile troops, that will be employed as an immediate instrument of law enforcement, in support of civil power, to quell effectively civil disorder, or to provide a covering force to meet and engage a hostile armed force pending concentration of the major elements of the Tactical Force."

Not the first specialized force in our military history, certainly—The Mounted Rifles, The Philippine Scouts, The Alaska Scouts are, to name but a few, earlier examples—nevertheless, the Zone Constabulary is one of our most ambitious undertakings. This complex corps-size organization has been formed in less than six months from a heterogenous collection of armored division combat commands, cavalry groups and squadrons, armored infantry and field artillery battalions, tank and antiaircraft battalions. Other than VI Corps and Headquarters, 4th Armored Division, there were no staffs of higher than group echelon. The entire force had to be integrated, equipped according to Constabulary TO/E, and trained, not only as soldiers but as soldier-policemen—as Constabulary troopers. As this is written on June 1, 1946 "on the job" training has begun; troopers are actually practicing the duties for which they have been trained, and the first of July will see Zone Constabulary fully operational.

While the area of the United States Zone may not seem large by American standards (44,248 square miles, or a bit smaller than Pennsylvania), the population exceeds 14,500,000 and is being augmented almost daily by refugees from former German held territory.

Horses play a part in the U.S. Constabulary in Germany. A horse platoon is seen in action in the photograph below. Animals are used in areas that are impassable for vehicles.

Signal Corps Photo

*Commanding General, U. S. Zone Constabulary.

BULARY

The existing problem is aggravated by the numerous deportees from Silesia, the Sudeten land, and the so-called New Poland. The Zone is critically short of housing, which always provides an incentive for a population to migrate. The people are frequently hungry, and, of course, subject to the usual moral degeneration which is the aftermath of defeat. Limitations on the German police encourages marauders to some extent, particularly in rural areas. To the normal police problem is added the presence of displaced persons, who are either unable or unwilling to return to their own countries. Often they bear a grudge against the German inhabitants, and among them is included a lawless element. The police problems of our own Army with its own troops are, naturally, ever with us, and the occupation mission of the Army as a whole demands policing of the German population with an emphasis on counter-intelligence. Giving full credit to all the agencies involved, the need for a mobile, alert, highly trained re-enforcing agency is indicated. Constabulary has the mission of fulfilling that need.

Headquarters, United States Zone Constabulary, Major General Ernest N. Harmon, commanding, is at present in Bamberg, Bavaria. The Constabulary is composed of three brigades of three regiments each. Regiments consist of a headquarters troop, composed of a horse platoon, a motorcycle platoon and a communications platoon; a service troop, a light tank troop, and three squadrons, consisting of a headquarters troop, two motorized and three mechanized troops. Mechanized troops are employed on patrolling missions, and motorized troops on supporting or re-enforcing missions. A squadron in Berlin and a regiment (minus) in Austria have been formed, but are not under the command of the United States Zone Constabulary. The regiments are distributed throughout the Zone so as to provide adequate support for police, government, and intelligence agencies. Two squadrons of each regiment are tactically disposed in the regimental area. One squadron, usually barracked near the regimental command post, is in reserve.

The principal enlisted component is AUS, but the aim is a Regular Army Constabulary-volunteer force. Constabulary service demands a high-type, alert, intelligent soldier, capable of acting on his own initiative but at the same time sufficiently well-disciplined to be reliable when acting on his own. He must be level-headed and physically impressive—a scatterbrain or a physical joke might make all the difference in the world in controlling a riotous mob.

"Troopers do not wear a different uniform, but a distinctive one. The highly-lustered OD helmet liner is banded in yellow-blue-yellow, the bands broken in the front by the Constabulary patch, which is a blue-bordered yellow circle containing a blue "C" pierced by a red lightning bolt. For special ceremonies, Russet leather Sam Browne belt, magazine pockets, first-aid packet and holster (each trooper carries a .45 automatic) are worn on duty. Trousers matching the blouse are worn with paratrooper boots, and a white pistol lanyard completes the dress for the trooper on duty.

Constabulary is not intended as a replacement for existing law enforcement agencies, either American or German. Rather, it is intended as a patrolling force, supplementing present agencies when necessary, and providing them with a ready reserve.

Constant patrols, operating on irregular schedules visit every village in the Zone at least once every 72 hours, and key localities are occupied. The occupation of key localities, however, does not mean that the Constabulary abandons mobility at those stations. Reception of an alarm at any time, day or night, will bring a hive of troopers in peeps, trucks, motorcycles or armored cars. The Troopers motto, "Mobility, Vigilance and Justice," is not meant as an idle catch-phrase.

One of the principal agencies which Constabulary is required to supplement is the Military Police. Where MPs are present the Constabulary does not function unless called upon; when MPs are not available, however, Constabulary does assume their duties.

All authorized border crossing points, both international and interzonal, are to be under Constabulary control, and Constabulary also is charged with providing border security patrols.

Search and seizure operations, the well-known "swoops," are another Constabulary function. Blocks, sections of a city, entire villages or other potential "hot spots" are surrounded and systematically searched for hidden arms, evidence of subversive activity or black market goods. Constabulary will also frequently be called upon to support investigative agencies in planned raids with specific objectives. "Operation Grab-bag," recently headlined as a Constabulary raid upon Danube

All the equipment known to modern military operations is at the command of the U.S. Constabulary. Fast, heavy, hard-hitting tanks, light, flexible, armored cars, mounting heavy caliber rapid fire cannons, and overhead the "eyes" of the artillery. The entire unit is linked together by two-way radio communications.

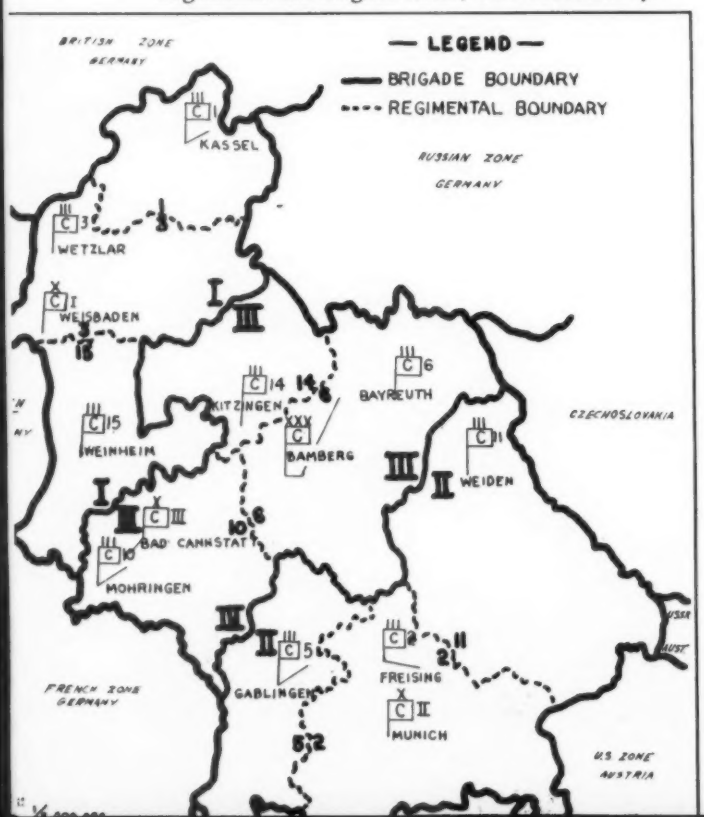
Signal Corps Photo

River shipping, was actually of the latter type. Although Constabulary had not become operational at the time of the raid, five squadrons, supporting the Regional CIC, were employed in sealing off and guarding ships on the Danube.

The German police, fairly recently reorganized, are hampered by shortages of equipment, transportation and personnel. Policemen are often inexperienced, and training facilities are limited. The prestige among their own people which the German police system once enjoyed was lost after the war for a number of reasons. Some of these reasons probably were the dissolution of the old police system immediately after occupation, the inability of the new Military Government police to implement their orders (they have only recently been armed), and a general breakdown of respect for German authority. All these factors cause a purely German police problem. Powerless to act against Allied nationals, the German police are occasionally disarmed and beaten by rowdy elements found in any Army or nation.

While members of the Constabulary on duty may assist the German police in efforts to arrest or to quell disturbances among the civil population, they do not normally interfere unless it is apparent that the police are unable to handle the situation. In the event of a breach of the peace by Allied or displaced persons, the individual German policeman is authorized to request Constabulary intervention. In most other cases, however —except in an emergency—requests for Constabulary assistance are made through Military Government channels.

Regimental and Brigade Areas, U.S. Constabulary.



Signal Corps Photo

Constabulary school graduates in Sonthofen, Germany, stage a demonstration for their commanding general, just after the completion of the intensive four weeks training course.

Very obviously, the mission of the Constabulary demands a type of training not normal to the average soldier. A glance at the curriculum of the Constabulary School at Sonthofen in Bavaria, illustrates the diversity of subject matter. Not too far from the beaten path of normal military schooling are subjects including tactical training, covering offensive and defensive combat, urban, rural and frontier patrolling, and riot duty, weapons, communications, maintenance, and mechanized tactics. However, other subjects are far different, and comprise police operations—including support and re-enforcement of existing American and German agencies, technique of arrest, rules of evidence, traffic control, law, orientation on CIC, CID, the military police —and Geopolitics, which includes the study of German history, geography, and legal structures as well as Military Government and Allied occupational forces.

Since the first class finished late in March of this year, graduates of the Constabulary School have offered invaluable assistance in training the units with which they have been posted. Much of the training task, however, has fallen upon heretofore unspecialized officers and men who have learned the hard way. Cadre training was conducted during March despite the formidable obstacles of unit movements, instructor shortages, lack of manuals and training aids, and the turning-in and drawing of equipment. Certain units were obliged to continue with occupation missions at the same time.

Beginning in April and through May, training continued in basic military subjects, with the addition of specialists subjects and topics peculiar to Constabulary. During this period for example, the Regimental horse platoons and motorcycle platoons acquired facility in the use of their mounts. Beginning in June, the Constabulary becomes operative in what amounts to a one-month shakedown "cruise," and present plans call for it to become completely operational by July.

The 86th Cavalry Reconnaissance Squadron

Screening of the 6th Armored Division near Muhlhausen, April 5-12, 1945.

*by Lieutenant Colonel Harry C. Brindle**

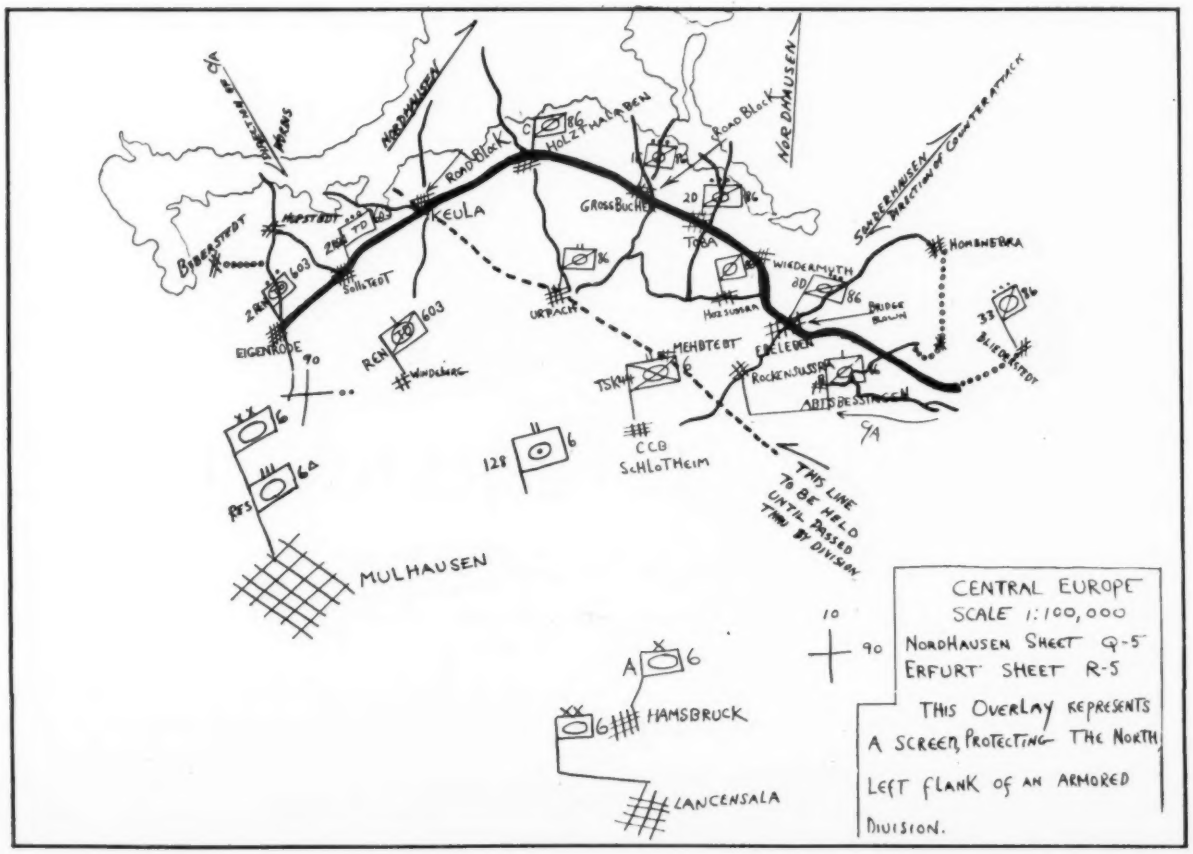
CONCLUSION

ON April 4, 1945, the 86th Mechanized Cavalry Reconnaissance Squadron, less Troop B, of the 6th Armored Division was given the mission of screening along a line northeast of Muhlhausen (WH9093).** The screen was to extend from Hohenebra (RD1405) through Gross Breuchter (RD0307) and Keula (RC 9407) to Huepstedt (RC8806). At this time, two combat commands of the 6th Armored Division were in assembly areas in the vicinity of Schlotheim (0498) and Lancensalza (WJ0382), while the third combat command had been committed to the northwest to wipe out an enemy pocket. The First Army had not yet come up abreast of the Third Army. The screening position was on the extreme left flank of the Third Army.

The squadron commander divided his security line into three sectors, and to each sector he assigned a mechanized cavalry reconnaissance troop, reinforced by one platoon of light tanks and one platoon of assault guns.

*Commanding 86th Mechanized Cavalry Reconnaissance Squadron.

**Maps: Central Europe 1:100,000, Sheets Q-5—Nordhausen, and R-5, Erfurt.



The three troops moved out at 0700 hours April 5 from Struth, in the vicinity of Muhlhausen. One troop advanced on Keula, one on Gross Breuchter, and one on Ebeleben (RD0802). The squadron, less the three reinforced troops and Troop B which had previously been attached to CCB, followed the route of the troop marching on Gross Breuchter.

Enemy resistance during the movement was light, consisting mostly of small-arms fire. All towns were cleared by 2000 hours with a minimum loss to the squadron. The squadron command post was located at Urbach (RC9903). By 1000 hours on April 6, roadblocks had been established on all main routes leading south toward Muhlhausen, Erfurt (WJ3270) and Weimar (WJ5271), and patrols were operating over unimproved roads between these main roads. Late on April 6, the squadron was reinforced by Troop B, reverting from CCB, plus the reconnaissance company of the 603d TD Battalion. Troop B was committed to reinforce and extend the screen to the east with the troop CP at Abtsbessingen (RD1100). The troop was ordered to send patrols to the east to Bliederstedt (1801) and to Hohenebra (1405). A counterattack was anticipated from the direction of Clingen-Greussen (2397). The reconnaissance company of the 603d TD Battalion was committed on the northwest flank with the company CP at Eigenrode to detect the presence or build-up of enemy troops in that area. The division previously had been hit by a counterattack from that direction.

During the ensuing week, the screen was constantly prodded by the enemy seeking to go south out of Nordhausen (RD1227), in the direction of Erfurt and Weimar. Several concentrated attacks were made by the enemy, but all were successfully repulsed, although not without loss to the squadron. This screen was maintained until contact was established with elements of the First Army at 1630 hours on April 12, 1945, in the vicinity of Nordhausen. It was later learned that as a result of the establishment and maintenance of this screen, the enemy was forced to move east rather than south, as had been his original intention.

This action reveals one method of setting up a protective screen with mechanized cavalry to secure a flank of an armored penetration. The planning provided for an alternate security line to the rear where the troops could be ordered to fall back (see sketch). However, the alternate line was ordered held until reinforced by other division units. The troops thoroughly understood the plan and made preparations to carry it out in case of a serious counterattack. The squadron CP was placed in the center of the screen and well forward behind the screen. This action illustrates the flexibility of mechanized cavalry units, and their capability to absorb counterattacks. Over the eight-day period, four counterattacks hit the screen at different places, but while the screen was badly bent several times, it was never penetrated and the original line was reëstablished.

The 89th Cavalry Reconnaissance Squadron

Delaying action by Troops A, B, C and E in the Befort area, December 16-25, 1944.

AT the outbreak of the German counteroffensive, December 16, 1944, the 89th Cavalry Reconnaissance Squadron was in the vicinity of Bissen. The squadron commander was ordered to move Troops A, B, C and E without delay to the Haller-Christnach area, where they were to be attached to Combat Command A, whose mission was to defend the Befort area.

Upon arrival at Haller, Troop A was attached to the 60th Armored Infantry Battalion, and outposted Befort; Troop B outposted Waldbillig and Christnach. During

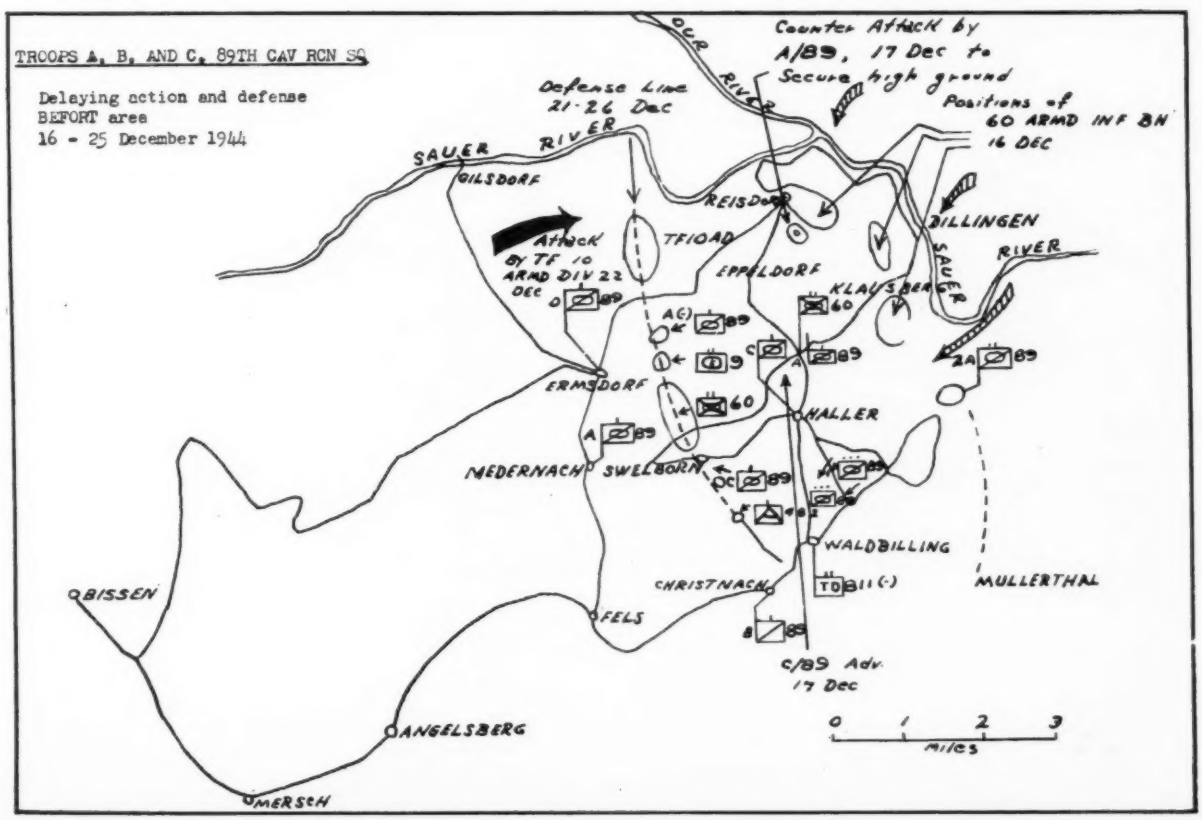
the night of December 16-17, the enemy infiltrated into the lines of the 60th Armored Infantry Battalion, and at 1000 hours December 17, Troop A counterattacked the position and drove the enemy from the high ground north of Befort. At 1930 hours, the commanding officer of Troop A received orders to hold Befort as long as possible, and to cover the withdrawal of the 60th Armored Infantry Battalion during the night of December 17-18 to the positions shown on the sketch, northeast of Ermsdorf. Under continuous heavy pressure from the enemy, Troop A completed its withdrawal to Waldbillig by 1400 hours, December 18.

Meanwhile, Troop B continued outposting Christnach and Waldbillig. It received orders to move toward Mullerthal at 1000 hours, December 17, and at 1230 hours was ordered to attack the town. Reinforced by four tank destroyers, Troop B attacked at 1330 hours and encountered determined enemy resistance which stopped its advance. Troop B then was ordered to withdraw, and to organize defensive positions on the high ground covering the approaches to Waldbillig.

Troop C arrived at Haller at 0730 hours, December 17. It attacked dismounted northwest toward Befort at 0800 hours, December 17, with one platoon of Battery B, 482d AAA Battalion, in support. The troop advanced to the line shown on the sketch, but continuing enemy pressure forced it to withdraw to the vicinity of Haller. At 0230 hours, December 18, Troop C moved to Sawelborn to defend the high ground along the north-south road in that area.

At 0400 hours, December 18, the troop organized its defensive position, using three platoons in line. Battery A, 482d AAA Battalion, covered the area on the south flank of Troop C. Troop A remained in Waldbillig until 1530 hours, December 18, when it was ordered to move to Medernach immediately. Here it received the mission of establishing active patrols in the vicinity of Ermsdorf, Eppeldorf and Gilsdorf. Troops B and C maintained their defensive positions, and Troop A continued its patrolling through December 21.

On December 21, a task force of the 10th Armored Division attacked and secured positions west of Eppeldorf, as shown on the sketch. Troop A was ordered on December 22 to maintain active patrolling between the task force of the 10th Armored Division and the strongpoints that had been established to the south (see sketch). All troops continued in these positions until December 26, when Troops A, B and C were withdrawn to a rest area.



The 92d Reconnaissance Squadron

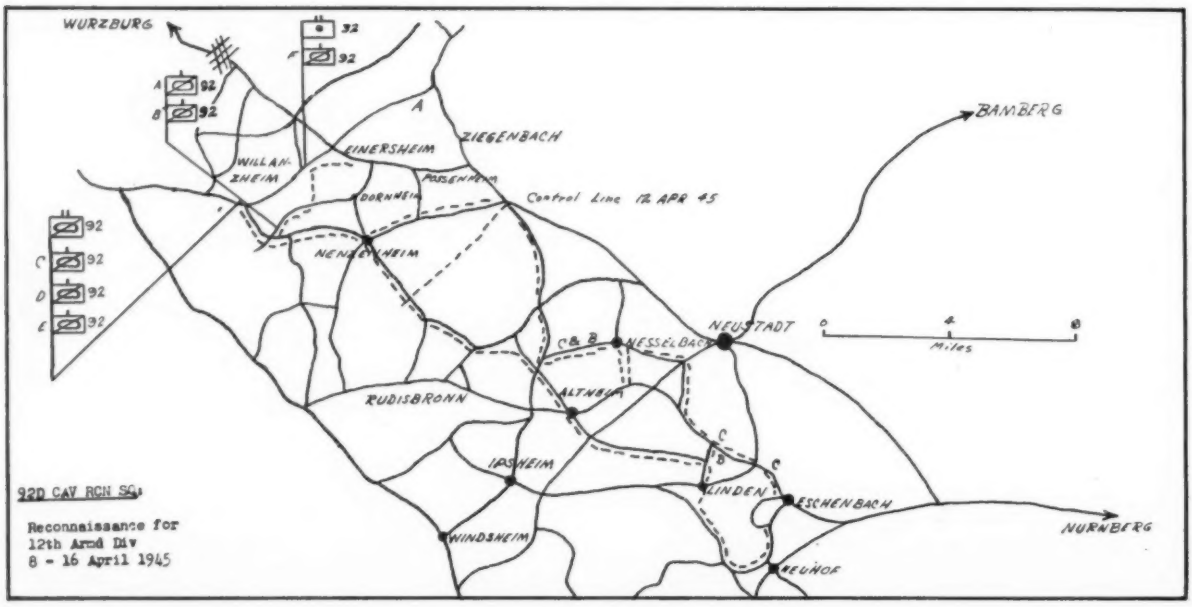
Reconnaissance for the 12th Armored Division in the Neustadt area, April 8-12, 1945.

ON April 8, 1945, the 92d Cavalry Reconnaissance Squadron, then generally south of Wurzburg, initiated reconnaissance from its assembly position east toward Neustadt. Two platoons of medium tanks were attached to the squadron, and one section, each, was attached to Troops A, B, C and D. One light tank platoon, each, of Company F, was attached to Troops A, C and D. The 342d Armored Field Artillery Battalion was attached to the squadron. The division mission was to continue the attack to the southeast.

At 1200 hours April 8, the squadron advanced, Troops A, C and D moving as indicated on the sketch. Troop B was in squadron reserve and Troop E, and the 342d Armored Field Artillery, initially at Willanzheim, were prepared to give supporting fire. At first the troops advanced against light resistance, but by 1800 hours had encountered a strong enemy line running generally from Possenheim-Dornheim-Nenzeheim. At dark, Troops A, C and D were all in enemy contact just west of this line.

On April 9, the Squadron observed and probed the enemy's positions to determine his strength and dispositions. On April 10, the Squadron received orders to continue its frontal pressure on hostile positions in conjunction with an attack of Combat Command B on the north, and to be prepared to pass through the gaps developed by this attack. On April 11, Troop A made contact with Task Force Norton of Combat Command B at Zeigenbach. The Squadron maintained its pressure on hostile positions through April 12, and that afternoon the troops were able to advance. However, prior to darkness all troops met heavy enemy small-arms and bazooka fire, and a line of contact was established, as shown on sketch. The Squadron also kept contact with Combat Command B on the north and the 116th Cavalry Reconnaissance Squadron on the south.

On April 13, the troops advanced again, and by dark Troop C was in contact with the enemy at Altheim, Troop D at Ipsheim, and Troop B at Ober Nesselbach. The remainder of the squadron moved on to Rudisbronn. Because of the road net, the advance was made on only two roads, Troop C being followed by Troop B, and Troop D by Troop A. On April 14, the squadron prepared to continue its advance to the east.



On April 15, Troop D, followed by Troop A, moved out on the route shown, encountering light opposition. By night, April 15, Troop D had penetrated the enemy position to Neu Selingsback, and the Squadron command post had moved to Linden. In the meantime, Troop A advanced against Neuhof, and by 1700 hours, April 16, had secured the town, in conjunction with Troop C, which moved in from the north. Meanwhile, Troop D remained in position at Neu Selingsback.

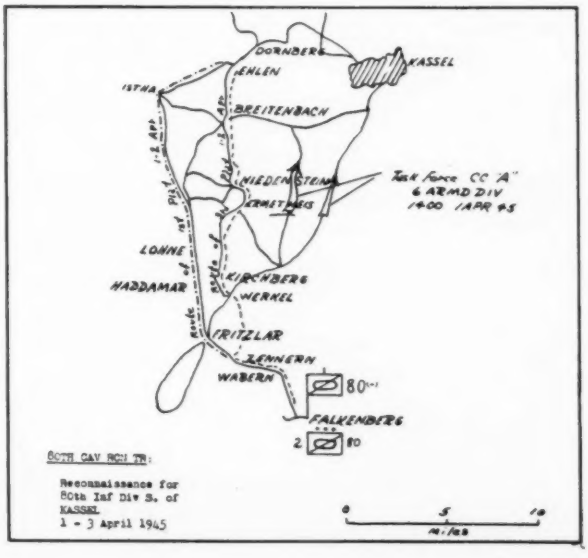
The Squadron had thus accomplished its mission of reconnaissance in force to the southeast, and had pushed against stiffening enemy resistance a distance of 30 miles.

The 80th Cavalry Reconnaissance Troop

Reconnaissance during advance of the 80th Infantry Division to Kassel, April 1-3, 1945.

AT 1400 hours on April 1, 1945, the two task forces of Combat Command A, of the 6th Armored Division, which were en route to seize Kassel, were halted six miles south of the town by corps order. The mission had been changed. By 1700 hours, the 318th Regimental Combat Team, of the 80th Infantry Division, passed through and relieved the combat command of the 6th Armored Division in its zone. The 80th Infantry Division was disposed with regimental combat teams abreast from east to west in the following order: 319th, 318th and 317th. The 9th Armored Division, under the First Army, was operating in the zone to the west of the 80th Division.

On the morning of April 1, the 80th Cavalry Reconnaissance Troop, of the 80th Division, assembled in the vicinity of Falkenberg and was assigned the mission of reconnoitering in the division zone, and of maintaining contact with elements of the First Army on the division's left flank. In executing the mission, the 1st Platoon reached Fritzlar, where it made contact with the 27th Armored Infantry Battalion of the 9th Armored Division, the 102d Cavalry Group, and the 2d Ranger Battalion—all elements of the First Army. The Platoon proceeded through Haddamar, Lohne, Merzhausen, and then went northeast to Niedenstein. In the meantime, the 3d Platoon followed the task force of the 6th Armored Division via Wahern, Zennern, Werkel, Wehren, Kirchburg, and Eermheis. No opposition was met by either platoon, but 15 POWs were taken during



the day. The 2d Platoon remained in troop reserve.

On April 2, the division met stiffening resistance on the outskirts of Kassel. This increased resistance was felt by the 1st and 3d Platoons as they continued north, and sporadic antitank and small-arms fire was received en route. However, the 1st Platoon reached Isttra and the 3d Platoon reached Breitenbach without difficulty. During this operation 15 POWs were captured, and two enemy trucks and two 88mm. guns destroyed. Contact was maintained with the 2d Ranger Battalion and the 102d Cavalry Group, and also was established with the 273d Infantry Regiment of the 69th Division. On April 3, the 80th Cavalry Reconnaissance Troop reconnoitered the zone of advance of the 317th Regimental Combat Team to Ehlen. Later that day, the Troop was relieved by the 3d Cavalry Reconnaissance Squadron (Mecz.) and was attached to the 319th Regimental Combat Team. The troop was then given the mission of reconnoitering the division's right flank south of Kassel.

This operation illustrates a typical assignment for a cavalry reconnaissance troop of an infantry division-reconnaissance, with security also provided. Enemy resistance was light and scattered, but was about the maximum which could be successfully engaged while maintaining the required speed.

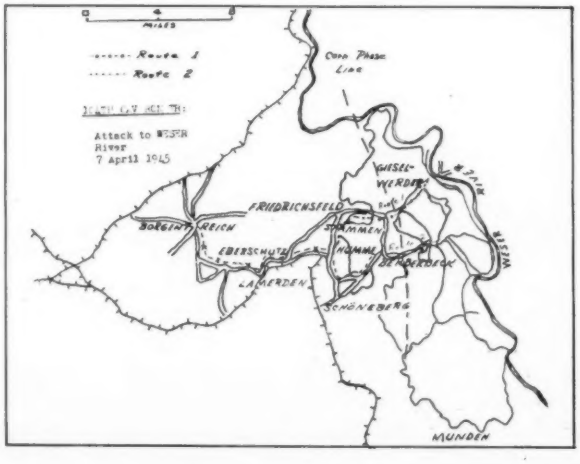
The 104th Cavalry Reconnaissance Troop

Attack from Borgentreich area to Weser River in advance of the 104th Infantry Division, April 7, 1945.

ON April 4, 1945, the 104th Cavalry Reconnaissance Troop (Mecz.), of the 104th Infantry Division, with a platoon of infantry and the assault gun platoon of the 750th Tank Battalion attached, moved from Padberg, Germany, to Hottheim. On April 5 and 6, this force, known as "Task Force Laundon," moved through Blankenrode and Borgentreich, protecting the division's left flank.

On April 7, 1945, Task Force Laundon, preceding the 413th and 415th Regimental Combat Teams, captured the towns of Lamerden, Eberschutz and Humme. At Humme, the force divided, with one platoon moving along Route 2 and capturing Schoneberg and Ederschutz. The 2d Platoon moved north from Humme and captured Stammen, then proceeded along Route 1 and captured Friedrichsfeld, and turned north again on Corn Phase Line and captured Gottsburen. The 1st Platoon moved along Route 1 and at 1505 hours reached the west end of Gieselwerder where it found the bridge over the Weser River had been blown. By 1700 hours, the final objective on the Weser River had been reached by all platoons. On the following day, the troop began a new mission of protecting the division left flank.

This operation demonstrated the ability of a mechanized cavalry reconnaissance troop, fighting on a lightly defended front, to operate with speed in advance of regimental combat teams, capturing successive key positions and making it possible for the bulk of a division to advance without loss of time.



36th Squadron in the ETO

Reconnaissance Platoon in Front of Infantry Division

*by Lieutenant Allen L. Zediker**

ON April 11, 1945, Troop B was relieved of the mission of flank security for the XIII Corps and attached to the 102d Infantry Division to perform reconnaissance in the division zone.

The 3d Platoon was given the right half of the division zone in advance of the 405th Infantry Regiment, mounted in trucks. Our mission was purely reconnaissance and we were not restricted to our zones if we found it necessary to move out of them to by-pass a strong point.

Our instructions were to report any enemy encountered or observed, and to report on phase lines one, two and three. When we reached phase line A we were to hold up and await further instructions.

The importance of phase lines in an operation of this type cannot be overemphasized. Even with the long-range radios which we have, it is the only sure means of control which higher headquarters have over their reconnaissance elements.

Until we reached phase line two we reconnoitered the zone quite thoroughly without meeting any resistance. We then received orders from the troop commander to push reconnaissance along a route through phase line A, phase lines 4 and 5, and hold up on phase line B. We reached phase line B at 1800, having encountered only a few straggling Wehrmacht and volkstrum troops. They surrendered readily, and were sent to the rear without escort.

After reporting our position we were instructed to outpost phase line B and await the arrival of the infantry, which, because of our 50-mile advance, was allowed to reach B plus attachments without dismounting any troops.

At 0600, April 13, we jumped off in our same zones toward our final destination, phase line C. As we progressed further into enemy territory we encountered numerous rear echelon troops who surrendered readily. By 1300 we had amassed a total of 250 prisoners. It was decided to send an escort of one machine-gun bantam and evacuate them to the troop CP 10 miles to the rear.

We continued on our mission, reaching phase line 7 without further difficulties. After crossing this point we encountered elements of a German paratroop regiment firmly entrenched in a heavily wooded area. Forced to fight our way out of the situation, we lost one man, killed three Germans, and captured 6.

After reporting the disposition and location of the enemy, we were instructed to by-pass and continue on our mission. While attempting to by-pass into the left platoon zone we liberated 500 American PW's with a 40-man German guard. After arming the Americans with available German weapons, and giving them all of our rations, we continued on our mission.

It was believed that the platoon in the left zone had encountered elements of the same paratroop regiment. This was confirmed when we received a message from the troop CO to return to the CP.

Infantry and artillery units were used to clean out the woods.

Conclusions

The advantage of placing the platoon leader in the turret of the leading armored car is clearly shown in this action. Where the platoon is roadbound, he is able to use and control the maximum fire power in his point vehicles. This position also enables him to control his platoon, and send back information through the two radio sets.

It is important that civilian population in areas occupied be instructed to put out white flags as a signal to the following elements that the territory is in our hands.

* * *

Tank and Reconnaissance Combat Teams

*by 2d Lieutenant Leroy O. White**

A HIGHLY successful combat team made up of one platoon of light M24s and one reconnaissance platoon was used by the 36th Cavalry Reconnaissance Squadron (Mecz). Such a team could accomplish fast and aggressive reconnaissance. Occasionally a section of tank destroyers was attached to it if enemy contact was expected.

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*3d Platoon, Troop B, 36th Cavalry Reconnaissance Squadron (Mecz).

*36th Cavalry Reconnaissance Squadron (Mecz).

This type of combat team was employed the morning of April 3. We had just crossed the Rhine River and moved up to a small town southwest of Munster, which was under attack on three sides. Three platoons were given the mission of making a reconnaissance to the northeast in an attempt to reach the town of Telgte. They were to secure and hold any bridges that were found intact, which would mean dropping off a part of the small task force.

The platoons moved out at 0600 and were to report to the CO by radio every half hour. When our platoon, which was first, reached the next town it was joined by a reconnaissance team. With the assistance of the scout sergeant in charge the following plan was formulated: the point bantam would lead out, followed by the M8 armored car, the tank platoon, and the mortar bantam. The platoon would move forward until it hit something suspicious. If a personal reconnaissance showed 75mm fire from the tanks was warranted, it would be laid, and then the platoon would try to go through. If this was impossible the obstacle would be by-passed.

The platoon moved along between 10 and 15 miles an hour, and by 1130 hours was starting to cross the main road which entered Munster from the north. The CO came up and said that the Jerries had it covered with 88s, and that the 3d Platoon had lost one tank. He advised us to find another way across, and stated that since the Germans were using the east road as an escape route from Munster it must be closed.

The squadron CO then arrived and told us that all the bridges were out across the canal northeast of Munster, but that the British had one across the canal and for the platoon to cross there. We reached the bridge control line at 1430, and after awaiting our turn in a line of troops two miles long, finally crossed at 1730.

The platoon rolled to within a half-mile of Westbevern, which was on the road to be closed. Here it halted to fire at a German soldier who had run into the cover of near-by woods. The company CO dismounted and ran him down for questioning. The prisoner said no German or American soldiers were in the town and identified his unit as an antiaircraft outfit, whose positions could be seen to our left. At this time 4 or 5 German soldiers were seen running for a dugout. The platoon opened fire with both .50 calibers and 75s and scored a hit with a 75 HE in the middle of the group, which eliminated it.

A bantam now was sent forward to the town. It was fired on at the outskirts by a burp gun and the crew dismounted and took cover. Since no antitank weapons were visible in the town, our tanks entered it. When they reached the center of the town, two panzerfausts were fired at them but missed, and the tanks continued to the main road.

They rolled on to the road within 50 yards of a truck full of Germans who were either in the act of mounting or dismounting. Tank machine guns and 75s opened fire. A 75mm hit in the middle of the truck took care of things.

As the tanks started forward, dismounted German soldiers who had approached under cover of a bank, hit the first tank with a panzerfaust. The other tanks immediately opened fire, and kept the enemy down long enough for the crew of the disabled tank to leave it and mount the second tank. Things got pretty hot then so we moved out.

The tanks proceeded to the edge of the town and were deploying to shell it into submission, when the squadron CO arrived. Informed of what had happened, he instructed us to place three tanks on the road leading into town in order to keep our supply lines open, and to take the remainder of the force and try to capture the next town to the north, Lehmbrock. It was on the same road that the Germans were using, and its capture would mean an accomplishment of the mission.

We reached the outskirts of Lehmbrock just after dark, and as we turned the first street corner the lead tank was hit by a panzerfaust. Part of the second tank's crew promptly dismounted to cover the crew that was leaving the disabled tank. The German soldiers who had fired the panzerfaust turned the corner directly in front of us, and were shot. Troopers ran to the tank and found that the crew had escaped. They soon returned to our position and reported that the town was filled with Jerries. We decided to remain on the outskirts and attack early the next morning. Road blocks were posted and security established for the night.

Before morning the rest of the company, Troop A and part of Troop E, arrived. The author returned to pick up the three tanks which had been left at Westbevern. While there, I saw that a large force of Germans was concentrating in the town, and heavy enemy armor moving along the road from Munster. The three tanks had beaten off two counterattacks, and this information was reported to the squadron CO when I returned.

The next morning at 0730 hours Troop A supported by Troop E's assault guns began a dismounted attack on Lehmbrock. The town was cleared by 1030 hours, and 500 PWs, including 135 Hungarian soldiers, were captured, and about 150 enemy were killed. Our casualties were very light.

At 1230 hours, we received orders to move to Telgte, about 6 kilometers away. A reconnaissance team and a section of tank destroyers were attached to the platoon.

We moved out about 1300, and had gone about two miles when the point bantam received fire, which was returned. Seven German soldiers surrendered, and were sent to the rear. We had little trouble the rest of the way to Telgte, and took 89 prisoners en route. At Telgte the town garrison of 29 soldiers surrendered, and were sent to the rear.

We had proceeded about a mile and a half from

Telgte toward Westbevern when we captured an enemy point. The NCO in charge said the point was a part of approximately 250 soldiers of all branches and two Mark V tanks which were moving from Westbevern toward Telgte. This was verified by reconnaissance. We turned back toward Telgte and were going to defend the town, but before we arrived there the CO radioed that Lehmbrock was under attack by a mixed force of tanks and infantry. He believed that we were possibly cut off and instructed us to return quickly. Our force was needed to help repel the attack. We reached Lehmbrock without trouble, put the tanks and TDs into position, and the Jerries were surprised when they started their next attack.

The described plan was used during the move to the Elbe River. At times, a reconnaissance platoon supported by a platoon of light tanks, were employed; at other times, a reconnaissance team was attached to a platoon of light tanks. It was found impracticable to send out a tank platoon unaccompanied by a reconnaissance element. Except for minor incidents this system was efficient. It enabled rapid movement, an effective reduction of minor resistance, and gave excellent protection to the units whose flanks it was protecting.

* * *

Deceptive Action by Reconnaissance Patrols

by Captain Roy L. Huckabee

MAJOR GENERAL GILLEM, commanding the XIII Corps, Ninth Army, visited the CP of the 36th Cavalry Reconnaissance Squadron (Mecz) in Willich, Germany on March 15, 1945, and stated that he had a mission that could only be performed by a cavalry outfit. It was required that aggressive patrols be sent across the Rhine River to make the enemy believe that a crossing would be made by the Ninth Army in the sector Lank-Latum-Mudrich.

At that time the 36th Cavalry Reconnaissance Squadron was performing a security mission, while the 44th Cavalry Reconnaissance Squadron (also of the 11th Cavalry Group) was responsible for the river line sector —Lank-Latum-Mudrich.

The squadron commander immediately called in the three reconnaissance troop commanders and gave them orders to reconnoiter at once for a probable crossing site during daylight hours. Each troop was to send a 7-man patrol across during the hours of darkness with the mission of reconnoitering by stealth over a route that would carry the patrols an average of 3,000 yards east of the river bank. These patrols were to determine: one, if the enemy had mined the waters or east bank of the Rhine; two, if he had constructed any obstacles on the far bank; and three, the location of enemy positions and installations, in preparation for combat patrols to go over on succeeding nights to take prisoners.

In the meantime the S-2 and S-3 called in representatives from the corps engineers and corps supporting artillery to coördinate plans for the patrol operations. The engineers were to furnish an assault boat and 7-man crew for each of the three patrols and an additional boat and crew for any emergency. The artillery was to prepare three separate fire plans to be ready to fire a numbered concentration, if called for by the patrols anywhere along the proposed routes.

Communication was to be maintained by an SCR-300 (Infantry set) with the patrol, one with the boat crew, who would establish a temporary beachhead, one on the near shore with the troop commander, who would have communication with the artillery OP by telephone and SCR-300, and communications to squadron headquarters by telephone and SCR-506.

Patrol plans were prepared early enough for the leaders and key members of the patrol to make a personal reconnaissance in daylight of the route to be covered. Plans were coördinated with units on our right and left, as there was always the possibility of the boats drifting off their proposed route because of the swift current (6-7 mph) and the wide river (450 feet).

Just one of the patrols encountered the enemy the first night and met only small-arms fire. It was evident that the enemy had a very light line and did not use any supporting mortar or artillery fire.

For 6 consecutive nights a minimum of three patrols crossed the river, alternating the routes, time of departure, number of men in patrols and type of boat, but always with the mission of: one, harassing the enemy; two, locating defensive installations; and three, making him conscious of increased patrol activity.

At the end of 6 days the enemy had definitely strengthened his line, as proven by successive patrols, PWs, and suppressed civilians who escaped across the river. In addition to the small-arms fire received the first night, the enemy fired 20mm, 60mm, and 80mm mortar, light and heavy artillery on patrols during the latter part of the period.

The patrols were aware that their mission of leading the enemy to believe a crossing was imminent in this sector could be accomplished only by aggressive action and boldly making their presence known. The success of the mission was evidenced by the increased activity in our sector after patrolling began, and the large number of troops trapped in sector Lank-Latum-Mudrich and backed up in the Rhur Pocket when several weeks later the Ninth Army crossed the Rhine River in the vicinity of Wessel.

The Assault Gun Platoon in Offensive Action

*by 1st Lieutenant Robert L. McMahon**

DURING the drives from the Roer River to the Rhine and the Rhine to the Elbe, the 11th Cavalry Group was assigned the mission of protecting the left flank of the XIII Corps of the 9th Army. It was the responsibility of the two reconnaissance squadrons of the group, the 36th and the 44th, to protect the often exposed flank from a possible German counterthrust from the north. The leading elements of the British Second Army and the XIII Corps were not able to keep abreast in their advance, and it was necessary to employ a mobile flank guard.

In this typical cavalry mission of flank security, the assault gun troop was used to support the advance of the reconnaissance troops. One assault gun platoon was attached to each of the troops. This employment proved more successful than keeping the troop intact to fire as a battery.

First, in a swiftly moving, fluid situation there are few occasions when the 6 guns can be effectively and quickly fired in battery. In the mounted action between the Roer and the Elbe there were no occasions when the guns in battery would have been vital to the advance. No formal lines of concentrated resistance were encountered and howitzers in battery were not necessary.

Second, immediate light artillery on mobile mounts can prove invaluable to the reconnaissance troops in their advance from position to position. In the team which results in the grouping of an assault gun platoon and a light tank platoon with a reconnaissance troop there is the combination of armor, fire power, and maneuverability—the characteristics of modern cavalry. With the advent of the light tank, M24, with its 75mm gun, this team received the added punch necessary to carry it through most light opposition.

The formation of this combat command in miniature is left to the discretion of the commanding officer of the reconnaissance troop. His decision should, of course, be based on the advice and recommendation of the platoon leaders of the attached elements. The reconnaissance troop commander should have adequate knowledge of the capabilities and limitations of these elements prior to the employment in any situation.

An excellent example of the most advantageous use of the 75mm assault gun was displayed on April 9, when the 36th Squadron was regrouping at Godshorn, a small town 8 kilometers north of Hannover. Attached to Troop C was the 3d Platoon of Troop E, led by Sergeant Joseph Kuberski, and a platoon of light tanks.

*Troop E, 36th Cavalry Reconnaissance Squadron (Mecz).

The squadron was in column approaching Langenhagen, led by Troop C in command of Captain John E. Newlin. Lt. Marshall Bivins' platoon was leading when the point team ran into 88mm fire. He deployed his platoon and radioed the information to the troop commander. In the meantime the assault gun platoon had been called up to a railroad embankment which provided excellent defilade for the howitzers. The platoon leader of the 2d Platoon, Troop E, at that time attached to Troop B, was called forward to assist Sergeant Kuberski in firing the platoon. Leaving a radio ¼-ton at the howitzer position, Captain Newlin moved out to act as relay between Lieutenant Bivins, who was observing, and the howitzers.

Because properly scaled maps were lacking, all data had to be estimated, and corrections made at the guns with the use of the graphical firing table. The first few rounds that were fired were smoke in order to aid observation, but they were of little value. The platoon then changed to shell HE M54 and the fuze setting was computed to assure a high air burst. Once the round was located, the fuze setting was lengthened so as to bring the burst onto the target. The gun crews chose their own referring points, and recorded their referred deflections without command.

During the entire process of laying, the forward observer and the relay station were under fire from the enemy guns. The railroad embankment was protecting the howitzers from direct fire from the 88mm guns, but occasional ricochets were landing within 50 yards of the platoon. All the rounds which ricocheted were armor piercing so the efficient firing of the battery was not interrupted by this fire.

To add to the confusion which invariably accompanies such action, Troop B was assigned a mission which required the support of the 2d Platoon. Captain Vernon L. Poynter, commander of Troop E, substituted in control of the 3d Platoon and continued to deliver fire in support of Troop C until the enemy was routed.

The German guns proved to be dual-purpose 88s mounted in concrete emplacements. Their primary purpose was the antiaircraft defense of Hannover, but the proximity of the 36th Cavalry caused them to be pressed into use as antimechanized weapons. Upon later inspection it was clear that the combined efforts of the armored car 37s, the light tank 75s and the assault guns had destroyed 6 of the 9 guns in place. The remainder were abandoned when the gun crews withdrew.

It is obvious that without the help of the cavalry's mobile artillery the entire squadron would have been held up until the position was by-passed or enveloped by dismounted parties.

This action alone is evidence that the assault gun platoon can be used to the best advantage in a mobile situation by attaching it to a reconnaissance troop to provide it with immediate light artillery support. Seventy-five millimeter howitzers can, and do, take the place of field artillery in rapid offensive action.

GAPA---Aircraft of the Future

by Major Hal D. Steward

"Gapa City," Utah, consists of six shacks and miles of desert sand. But its importance is greater than its size for here the first Ground-to-Air Pilotless Aircraft weapon was launched in middle August.

A heretofore secret guided missile, designed as a potential defense against possible attack by high-speed, high-altitude enemy aircraft, the GAPAs are manufactured by the Boeing Aircraft Company. When perfected, they are expected to be capable of seeking out and destroying possible enemy weapons before they can reach their targets.

Pencil-slim and 10-foot long, 60 GAPA projectiles are to be fired in Utah this year in the first phase of an extended program scheduled to last several years. First test models of the new guided missile are propelled by standard aerojet rocket units. A booster power unit is attached to the tail of the projectile, accelerating the missile to high speed within a few seconds.

The firing range for the GAPA is located in the heart of the Great Salt Desert of Utah. Heat, alkali dust and the blinding glare of the white salt plains make this desert an unpleasant place in the summer.

Firmly embedded in concrete, the GAPA launching tower rises to a height of 40 feet. Made of steel, the tower is strongly stressed and painted a brilliant yellow.

Called "Old Needlenose" by the men who work with it, the projectile is armed after it has been hoisted into place on the tower. The missile is armed with remote control ignitor fuses.

Four theodolite stations are situated in the desert to track the missile from launching to landing so that a complete record of the GAPA's progress can be had for later study.

Three hundred yards from the launching tower is the "dugout," headquarters of the firing operation. Here the switch is thrown to send the missile shooting into the sky. It is an underground structure of heavily reinforced concrete thickly piled with sand.

Because of the tests being conducted at "Gapa City," sometime in the future it may be possible to develop man-carrying aircraft capable of bolting around the world in a matter of hours. These tests may well be the forerunner of rocket ships.

"Once problems of control and stability are solved," it has been pointed out by W. E. Beall, Boeing engineering and sales vice-president, "the principles involved in this new weapon may have far-reaching effects on the design of future passenger or cargo-carrying aircraft."

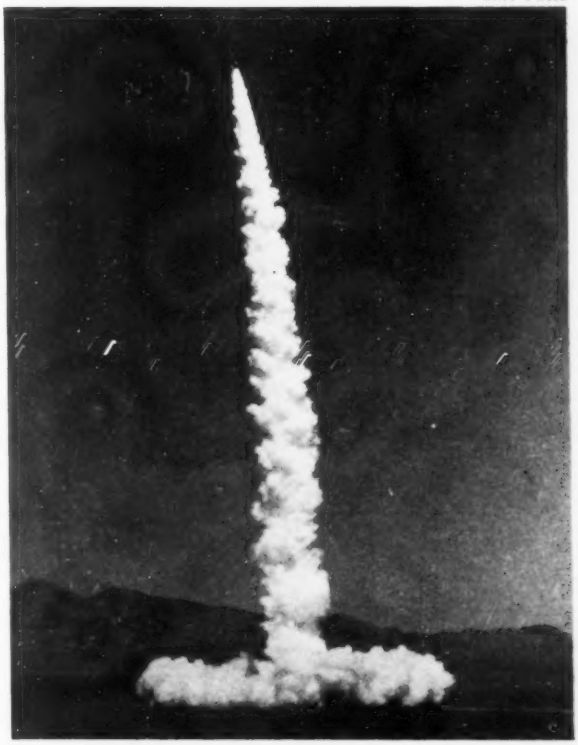
A 30-man staff operating out of Wendover Field, Utah, is carrying out the GAPA test program. Head of the Boeing GAPA unit is Richard H. Nelson, who served as project coördinator on Boeing's B-17 Flying Fortress construction during the war. Engineering staffs in the Boeing plant at Seattle, Washington, are working on further details of the GAPA program.

What is the speed of the GAPA? How high did she go? What is her effective range? The answer to these questions must be discovered by the engineers.

How the GAPA is manufactured and details of its design are War Department secrets. Only recently did the War Department make public the fact that work on the GAPA has been going on now for more than 15 months.

This heretofore secret guided missile, designed as a potential defense against possible aircraft, is being experimented with in the Great Salt Desert of Utah. It is pencil-slim and 10 feet long.

AAF Photo



Editorial Comment

Captain Heartsill.

CAPTAIN CHARLES E. HEARTSILL, our former Associate Editor, was relieved on September 1st in order that he could be discharged and returned to civilian life again. Captain Heartsill has served the JOURNAL staff for over a year and a half. Always a hard and conscientious worker, he had the bad luck to join us when the going commenced to get tough. He practically ran the journalistic department singlehandedly and the continued high quality of our magazine was due largely to his untiring efforts. He leaves the army to conduct his own business, a photographic studio in Marshall, Texas. The Executive Council joins the staff in extending our thanks to Captain Heartsill for his untiring efforts in maintaining the high standards of the ARMORED CAVALRY JOURNAL and wishes him the greatest of success in his new business venture.

NEW ASSOCIATE EDITOR

Major Hal D. Steward is our new Associate Editor. We are very fortunate in securing the services of a veteran journalist for this job. Major Steward, who was a newspaperman and free-lance writer in civilian life, spent nearly two years in the South and Southwest Pacific Theaters. He has five major Pacific campaigns to his credit and for a year was Public Relations Officer of the First Cavalry Division. He is the author of *The First Was First*, a short history of the First Cavalry Division and its Pacific campaigns. Before coming to the ARMORED CAVALRY JOURNAL he was assigned to the War Department.

STAFF MEMBER DECORATED

Master Sergeant William R. Rossow recently joined the staff of the ARMORED CAVALRY JOURNAL as Circulation Manager and it is a great pleasure to publish the following citation which he received to accompany the award of a Commendation Ribbon from the War Department when he was relieved.

"For outstanding service from 21 January to 18 June 1946. Master Sergeant Rossow trained and organized into an efficient operating force a group of personnel to record, route, and regulate the movement of cases coming before the Army Ground Forces Integration Board. By his initiative, dependability and success in meeting unexpected situations he contributed outstandingly to the progress of the Integration program."

SOLDIERS COMMEND LEADERS

In view of the widespread publicity given to adverse criticism of the so-called "caste system" the following letter is quite refreshing. It is dignified, sincere and spontaneous. It is a pleasure to print it in this column.

SPECIAL NONCOMMISSIONED OFFICERS CLASS No. 2

Fort Benning, Georgia

6 August 1946.

SUBJECT : Appreciation and Commendation.

TO : Brigadier General Whitfield P. Shepard, The Assistant Commandant, The Infantry School

THROUGH: The Commandant, The Infantry School Fort Benning, Georgia.

1. We the undersigned members of the Special Noncommissioned Officers Class No. 2 are so full of appreciation for the fine leadership which the officers listed below have given us and for the splendid example that they have set for us as soldiers to follow that we wish to go on record in this way in expressing our appreciation.

Colonel Theodore Andrews
Colonel William O. Blandford
Colonel Charles U. Knaub
Lt. Colonel Hubert C. Hicks, Jr.

Lt. Colonel Duke E. Jones	Captain Clifton C. Fox
Lt. Colonel Clair B. Mitchell	Captain Edward Gorecki
Major Charles W. Sample	Captain Edward B. Kitchens
Major Charles H. Schrader	Captain Roy B. Quinn
Major John E. Tilton	Captain A. Q. Smith
Major Warren E. Walters	Captain William H. Wikoff
Captain William K. Dielman	Lt. Norman L. Engard

2. We are fully aware of the current discussions in the press about the so-called "brass" in the Army which would lead the American public to believe that the rank and file of Army officers are hard-boiled and cold-hearted toward enlisted men. We feel that if the American public at large were aware of the type of leadership that we soldiers have enjoyed here at Fort Benning under the guidance of the officers listed that even the critics would change their attitude as reflected in part of the press.

3. The officers listed have not only been excellent instructors but they have demonstrated a sincere and intense interest in our welfare from every point of view. Thus, setting a lofty example worthy of emulation by us as noncommissioned officers who in turn must prove our value as such in the hearts of the privates.

4. It is hoped that the Commandant of The Infantry School will make known to these officers the contents of this letter as a humble and sincere expression of the appreciation of the signers of this letter.

SIGNED BY 92 MEMBERS OF THE CLASS.

* * *

LETTER TO THE EDITOR

HEADQUARTERS REPLACEMENT TRAINING CENTER

Office of the Commanding General

Fort Knox, Kentucky,
9 August 1946.

Colonel E. M. Sumner, Editor,
ARMORED CAVALRY JOURNAL,
1719 K Street, N.W.,
Washington, D. C.

Dear Sir:

It was quite a thrill to receive the first issue of the ARMORED CAVALRY JOURNAL. Only those officers who lived through the years of struggle hoping to see Cavalry regain its rightful place in the sun can appreciate the significance of this step. At last, true cavalrymen and not merely horsemen have ridden to the front. At last cavalrymen are recognized for what they really are—"soldiers who fight mounted," and not merely "soldiers who ride horses."

I look forward with confidence to the day when it will no longer be necessary to prefix the name of our branch with "armored." I do think it is necessary now, during the transition and educational stage. But the day will surely come when the word "cavalry" by itself will mean to all what it has always meant to true cavalrymen—"soldiers who fight mounted" regardless of what their mount may be.

There is no use to voice regrets now but I cannot help but be saddened by the thought that so many great cavalry units will go down in history by another name. Approximately one-fourth of our divisions in Europe on V-E Day were cavalry but the world may never know them as such. There is some hope, however, that in our school system of the future there will emerge an ever-increasing tendency to refer back to their exploits as "cavalry action," particularly if the JOURNAL and cavalry officers continue to point out the facts.

It should be apparent now more than ever before in history, that where there is ground combat decisive results can only be obtained by an army properly balanced between dismounted (Infantry) and mounted (Cavalry) units. We have the comparatively fresh examples of World War I where we were totally lacking in cavalry and World War II where we had a sound and proper balance. The student need only look at the comparative results from which a child can derive the reason.

It will soon be time to see that this step is carried to a logical conclusion in the designation of units. The term "armored infantry" is not applicable to mounted soldiers of modern cavalry. They are cavalrymen if there ever were cavalrymen. They now have "horses" from which they can use their weapons with deadly effect. No longer must they rely on the short-range pistol or the arm's-length saber from an unstable seat astride a horse. As they "gallop" toward their objective today, they confidently pour a sheet of fire from powerful long-range weapons that make their "charge" irresistible. Can you not imagine the sheer delight and cheers of Stuart, Forrest and Sheridan could they but return to command the cavalry of 1946?

I have heard officers express regret at the relegation of the horse to the fringe of the world's battlefields. But I have not heard such sentiments expressed by those who, like myself, have seen the roads and trails strewn with the bloated carcasses of faithful animals that were forced to pass through the hail of air and ground attack. *There were no foxholes for horses.* But the mounted soldier was not to be denied. He broke and trained new "horses." The record is conclusive. No scoffer can laugh it off. Once more, and for the first time since the days of '65, the cavalryman can hold his head high; he proved himself in battle. The mounted soldier clinched the most decisive victory in the history of war.

I congratulate the Armored Cavalry Association. I look forward with confidence to the successful restitution of cavalry in the teachings and thought of our mili-

tary school and in the organization and training of our ground army.

R. W. Grow,
Brigadier General, U. S. Army,
Commanding.

Jeb Stuart, sired by Gordon Russell, and grandson of Wilton Lackey, is dead.

Prewar devotees of the National and other well-known horse shows will remember this great horse as one of the best-known Army jumpers ever to appear in public.

Starting his career in 1933 he was selected for the 61st Cavalry Division Horse Show Team (New York) and stayed on the team until it was disbanded in 1940. His collection of military trophies and ribbons totals 304, of which 255 are in the first three grades of Champion, Reserve, or Blue. His shows included West Point; National; Piping Rock; Squadron "A," New York; New York Riding Club; Brooklyn; Staten Island; Essex Troop, Newark; Atlantic City; Orange; Westchester; New Haven; Chicago; Albany; Governor's Island; and Stamford.

Purchased at the age of three by Colonel Herbert H. Frost, Jeb was schooled and ridden by his owner. He was retired in December, 1941, at the time Colonel Frost went to duty with the Armored Force.

Jeb Stuart taking the triple-bar with his owner Colonel Herbert H. Frost.

11th ARMORED DIVISION ASSOCIATION NEWS

THE THUNDERBOLTS had plenty of problems to lick before they shoved through Linz toward Vienna, so we are not downhearted because our attempts to get the Division Association rolling, have run into some rugged obstacles. The Division files have been located in St. Louis and as soon as the bureaus with priorities to use them are satisfied, they will be turned over to us. Your help in getting every name and address you possibly can, to your Secretary, will be the best assurance that the records we have are correct—invest a penny post card and let us have all the dope you can. Address: The Secretary, 11th Armored Division Association, 1719 K Street, N.W., Washington 6, D. C.

The Division Association was not organized until August 15, 1945 in Gmunden, Austria, when it was found that there was no remaining record of the addresses of the 12,000 men who had already left and the secretary had only 6,000 names of eligibles. Since then, mainly through the efforts of a few men we have contacted, and others who have replied to a notice which appeared in newspapers throughout the country, our list has grown considerably.

We bumped into John Case of CCB in Sears Roebuck and he knew the address of Joe Bradford of the 22d. Luck also brought the two of us together at a soft drink stand in Franconia, New Hampshire, and we added to our group, young Dick Dufour of the 63d A.I.B. Milton Silver, CCA, writes of a group meeting in Brooklyn and John Janecek of the Band, has contacted quite a few more men on a recent trip to Milwaukee and Chicago.

Scattered around the map are these former commanders: Howard, Lowe and Palmer in the ETO—Mullins has the 25th Div. in Tokyo. Bell reported convalescing in a Long Island hospital—Yale in Paris—Kilburn in Vallejo, California and Brooks and Dager in Atlanta with the 7th Army.

We are working on a NEWSLETTER which we want to get out as soon as possible, so send us a few words about what you are doing, and your ideas as to where our reunion meeting should be held. So far, Chicago has the most approval, although St. Louis, Denver and Milwaukee have a lot of votes.

We will sign off with the reminder that we want to get that NEWS. If we get enough replies from the Executive Committee (made up of your unit representatives) we will give you the preliminary plans for our first reunion.

AN EDITORIAL

Atom Bomb Commentary

by Major Hal D. Steward, Associate Editor

(AUTHOR'S NOTE: *Background material for this article was obtained from Commander L. V. Julihn, member of the Public Information Staff of Joint Army-Navy Task Force One. However, the opinions expressed and conclusions reached are the author's own.*)

SELF-STYLED "military and naval experts" have jumped to the conclusion that the results of the Bikini Atom Bomb tests are the final word on whether there will be an Army, Navy or Air Force in the future. Such talk and conclusions are foolish.

Cries of "the atom bomb eliminated the need for a Navy"; "the Air Force is now outmoded and from now on everything will be rockets" are heard everywhere. Nothing in any of the atomic bomb tests substantiates these contentions.

The purpose of the Bikini tests is greatly confused in the minds of many. Misconceptions of the results of the experiments have cropped up everywhere.

The Bikini tests in no way definitely prove that the Navy is here to stay, is subject to radical conversion, or that it will be obsolete in offense or defense in any future wars. From information available, it is not believed that the atomic experiments in the Pacific were held to determine what armed services will have to be eliminated from American defense plans. It is much too early in the game to reach any such conclusions. In all probability it will take years of research, experimentation and development to determine what the future of the armed forces will be in relation to the atom bomb.

Basic purpose of the Bikini experiments was to obtain information on a graduated scale from maximum to minimum of the effect of the atomic fission on a target array composed primarily of Navy ships, but also including many other types of military equipment. As an important corollary live animals were used to obtain data on the possible dangers to service personnel inherent in atomic explosions. From this basic information, Joint Army-Navy Task Force One (Operation Crossroads) officials hope to obtain valuable guideposts to the most efficient offensive and defensive strategy and military equipment in an atomic age.

The Bikini target array resembled no known naval array, either at an anchorage or at sea. Twenty-three ships were grouped in a tight circle which normally would have floated two or three ships at anchorage or one capital ship in a task group formation at sea. Had all 23 ships been sunk by the Atom Bomb blast, the question of the need for a future Navy would not have been settled. The results would have proved that 23 ships should not be grouped in a circle of 1,000 yards radius. This fact was learned long before atomic bombs were a reality.

The picture must be looked at objectively. The future of the Navy depends entirely on the ability of the scientists and inventive engineers to create a transporting medium and an attacking force capable of carrying out the present mission of the Navy more effectively than any other means. Perhaps atomic explosives and new developments in long-range aircraft may provide better methods of carrying an offensive across the sea than can be supplied by the Navy. As yet, however, no planes have been devised which can carry the personnel, heavy equipment, and all other incidentals which must accompany a large-scale invasion of a country.

This same reasoning can be turned on those who maintain that rocket warfare has outmoded both the Air Force and the Navy. American self-propelled rockets are still in the drawing-board stage. Drawing-board rockets can never replace aircraft as long as they remain on the drawing board. Until something else can take over their functions the Navy and Air Force will remain in existence.

Second basic fact of the Bikini tests is that the tests while not creating a medium for the replacement of the Navy or the Air Force are devised to show us how to make U. S. fleets as safe and effective as possible in an atomic age.

Test Able (air drop) at Bikini gave the sincere scientists much of the basic data for which they were seeking. The test indicated that protective alterations must be considered and developed if personnel on board naval ships are to be saved. Many other things about the bomb were discovered that will be revealed at a later date when the information has been fully evaluated.

Test Baker (detonation of an atom bomb just under the surface of the ocean) provided information on the ability of naval hulls to withstand blast effects of atomic power. It should indicate what means are necessary to improve hull designs, and what tactical formations are best to protect a fleet against an atomic blast.

Test Charlie (detonation of an atom bomb deep in the ocean) will take place in 1947 as scheduled.

Both military and naval experts know that the use of the atom bomb in warfare calls for radical changes in

equipment, tactics and technique. Certainly some method is going to have to be devised to protect industries from the blast of the bomb. Perhaps large industries will have to be moved underground or enclosed in solid walls of heavy lead or concrete. These things are under consideration now and only successful experimentation and development will find the correct solution.

But, in the meantime atomic bomb thinking must not go overboard. Military men especially should look at the atom bomb and its potentialities from an objective point of view. Persons must not be taken in by stories of the atomic bomb written by overenthusiastic and uninformed writers.

Legislation was passed by Congress on July 26, 1946, and signed by the President on August 2, creating a new civilian agency with complete control over atomic energy development. The new law provides for a commission of five civilians who will direct all future atomic developments.

The Army will have a consulting and advisory role in relation to this commission.

Supply of An Armored Division in Combat*

*Extracts from a Letter from Colonel E. Busch***

PRIOR to the invasion of France, it was impossible to obtain an agreement on the daily POL [petrol, oil, lubricants] requirements of an armored division. The estimates varied between wide limits—as nearly as I can recall, between 40,000 and 100,000 gallons of gasoline per day.

These data were compiled by Lieutenant Colonel W. A. Boyle, Division Quartermaster, 6th Armored Division, from records maintained by his office during the campaign through France, Belgium, Luxembourg, and Germany for the period 27 July 1944 to 9 May 1945, inclusive.

The 6th Armored Division played a full part in the campaign. During the initial phase, it operated in the Brittany peninsula, later moving to the Eastern Front.

POL and Rations consumed by the 6th Armored Division during the campaign of Third Army through France, Belgium, Luxembourg, and Germany, starting at the Normandy beaches and ending at Altenburg, Germany, for the period 27 July 1944 to 9 May 1945, inclusive—total 287 days:

Item	*Consumed*	*Average per Day*
V-80 Gasoline	5,497,770 gal.	19,156.00 gal.
V-80 per food ration		1.32
Kerosene	3,815	13.3
Diesel	6,552	22.8
White Gasoline	1,635	5.7
73 Octane Gasoline	3,830	13.3
SAE No. 10	13,457	46.8
SAE No. 30	60,675	211.4
SAE No. 50	45,205	157.5
SAE No. 90	7,105	24.7
GP No. 1	23,856 lbs.	83.1 lbs.
GP No. 2	40,922	142.5
GP No. 3	6,883	24.0
GP No. 4	129	.45
[1]Coal	296 tons	1.00 ton

Approximate tonnage: 73.32 per day.

Rations consumed during the 287-day period:

	Total	*Average per Day*	
"A"	2,344,605	8,169.35	
"10-1"	929,385	3,238.28	
"K"	576,566	2,008.94	
"C"	315,738	1,100.13	
"D"	(104,616)	(364.50)	No ration. Used as supplement.
TOTAL	4,166,294	14,516.70	Less "D's"

Approximate tonnage: 30.6 per day.

POL and Rations consumed by the 6th Armored Division during the last 98 days of the campaign, 1 February 1945 to 9 May 1945. This was a period of intensive operations starting in the vicinity of Luxembourg and ending in Altenburg, Germany.

Item	*Consumed*	*Average per Day*
V-80 Gasoline	2,422,620 gal.	24,721.00 gal.
V-80 per food ration		1.75
Kerosene	3,170	32
Diesel	2,975	30
White Gasoline	840	9
73 Octane Gasoline	3,830	40
SAE No. 10	2,605	26
SAE No. 30	26,925	274
SAE No. 50	23,245	237
SAE No. 90	3,965	40
GP No. 1	10,048 lbs.	102 lbs.
GP No. 2	20,070	204
GP No. 3	482	5
GP No. 4	77	.75
[1]Coal	66 tons	.67 ton

Approximate tonnage: 93:45 per day.

Rations consumed during the final 98-day period:

	Total	*Average per Day*
"A"	785,769	8,018
"10-1"	228,615	2,333
"K"	222,120	2,266
"C"	142,980	1,459
"D"	none	
TOTAL	1,379,484	14,076

Approximate tonnage: 29.48 per day.

[1]Does not include quantities found locally within unit areas.

*Military Review.

**Quartermaster Corps.

OTHER BRANCHES

Major General Clift Andrus

TABLE OF CONTENTS

The Field Artillery 36
By Colonel Robert F. Hallock
Cooperative Training—Infantry and Armor 39
From The Infantry School
Development of the Airborne 40mm AA Gun 42
By Major Thomas G. Gentel
The Gallant Little "L" Plane Had Versatile Uses in World War II 45
By Charles Villency
Medical Care in Combat 47
From Surgeon General's Office
Marine Tank Lessons Learned at Guadalcanal, Bougainville and Tarawa ... 49
By John L. Zimmerman and Joel D. Thacker
Army Transportation Corps 51
By Lieutenant Colonel Russell F. Oakes

"The Field Artillery is vitally interested in this subject of 'Other Branches' which you are so ably presenting. Since Field Artillery is essentially a supporting arm, its success in battle will depend to a considerable degree on its knowledge of the tactics and technique, as well as of the viewpoint and mental and physical status, of those whom it supports. As a versatile and extremely powerful member of the team in battle, it renders the Infantry and Armor the most effective assistance when it knows how each executes its part in the effort of the whole.

"Mutual confidence and understanding are vital to success in combat. These can be built up through peacetime training and exchange of ideas. Your new department makes a most influential and forceful contribution to such peacetime training and exchange of ideas. I am happy indeed, to add my commendation to the Armored Cavalry Journal for this most praiseworthy development."

Clift Andrus

Major General, U.S.A.,
Commandant, The Field Artillery School

FIELD ARTILLERY

The Field Artillery

*by Colonel Robert F. Hallock**

The Artillery Mission

THE book says that the mission of the field artillery is to support the other arms. There are certain free-thinkers who claim that this is an understatement of the case, and that a bit more consideration of the effectiveness of the artillery arm as a means of killing the enemy, and less as a mere auxiliary weapon, would get the battle won more quickly and more decisively. Be that as it may, the artilleryman is trained to think in terms of the battle as a whole, and to seek the means and methods whereby he can further the action of the entire force. This has been accomplished by a generation of indoctrination in the concept of the "supporting arm," and there are few, if any, artillerymen who have any inclination toward "empire building" or toward the separation of the field artillery from its place in the close-knit fighting team of all arms.

On the contrary, every effort is being made—in training publications, in the schools, and in unit training—to tie the field artillery ever closer to the supported arms. It has long been apparent that the artilleryman must spend more time and thought on the study of the technique, tactics, and problems of the assault elements than those supported elements spend on the study of the field artillery. It is obvious that the impetus of support must come from rear to front, and that the job of the artillery is to *deliver* the necessary support, and not wait for anyone to come and ask for it.

Combat Efficiency

Nevertheless, it takes at least two to make a partnership, and the better the two partners understand each other the better that partnership will function. One of the greatest of the difficulties faced by the artilleryman during the past war was the problem of convincing the supported units of the effectiveness and power of the readily available artillery. A single example will illustrate the point. An infantry regimental commander was concerned about a certain heavily reinforced German pillbox. A forward observer took it under fire with his light battalion without visible effect. The FO said, "Colonel, I can get an 8-inch howitzer battalion on it if you will OK it." The colonel demurred, mentioning complicated channels of command and communication and long delays, but finally said, "Go ahead!" In a few minutes the pillbox had been destroyed, and from then on that regimental commander demanded 8-inch howitzers on any and all targets, including infantry patrols and rumored light mortars!

An Analysis of "Support"

Let us analyze this mission of "support." It does not necessarily mean the physical presence of the weapon with the supported troops. Modern self-propelled, high-speed, armored artillery can move and fight with the assault elements of infantry, and armored cavalry. It has done so in the past war, and will continue to do so whenever appropriate. But, with available range from 0 to 35,000 yards, and traverse up to 60 degrees—all available in a few seconds without moving the carriage —a primary attention should be given to the maneuver of the fire of the artillery, and only a secondary attention given to the maneuver of the pieces themselves. Of course, if the pieces are located well forward, it facilitates communication, liaison, and the smooth operation of that "close-knit fighting team." Range is built into artillery cannon, not for the purpose of permitting them to sit well back of the front lines, but to permit them to reach out into the depths of the enemy position and hit him where it will hurt the most.

The Three Artillery Missions

The Air Forces have thoroughly indoctrinated us all with the fact that they have three missions: first, to gain supremacy over the enemy air forces; second, to isolate the battlefield; and third, to render close support to the ground forces. There is a close parallel between the missions of the air forces and the missions of the field artillery. First, the artillery must engage in counter-battery operations to protect the supported units from enemy artillery action and to secure its own freedom to pursue its other missions. Second, it must disrupt and destroy enemy communications, supply, and other movement and installations in the rear areas. Third, and finally, it must neutralize or destroy those enemy forces and installations which interfere with the action of our own forward elements.

What are the priorities of these phases of the artillery mission? That is a highly debatable question, and the best answer is the good old stock phrase, "It depends on the situation." If the enemy artillery is strong, active, and effective, counterbattery operations must

*Director, Department of Combined Arms, Field Artillery School.

receive great attention. If the enemy is engaged in rushing up reinforcements and supplies in great quantity, isolation of the battlefield becomes of primary importance. If the enemy infantry is strong, well-armed, well-disposed, and well-led, most attention must be given to close supporting fires.

Handling of Missions

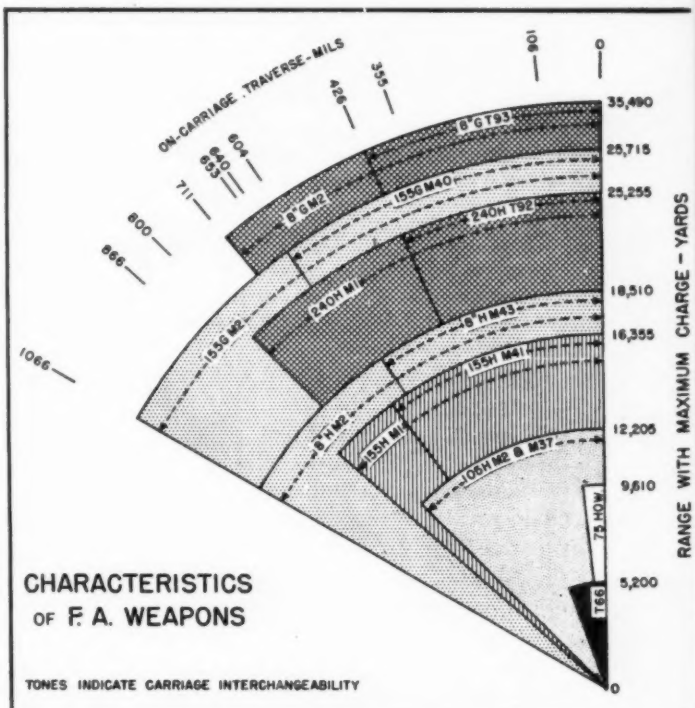
Fortunately, this problem is not as difficult as it might seem at first glance, and for two reasons. One is that the artillery cannon is a powerful and versatile weapon, and can handle any or all of these missions in rapid succession. If we consider the battery or larger unit, it can handle them all simultaneously. Certainly, a two-howitzer battery of 240s cannot fire as many rounds on a counterattack in as short a time as a six-howitzer battery of 105s, nor can a 105 howitzer knock out an important bridge at 22,000 yards. However, it may be stated that all types of artillery weapons can and do undertake all types of missions with good results. The second reason is that the field artillery is organized and equipped for the purpose of handling all of these missions at the same time. The bulk of the close supporting fires will normally be furnished by the division artillery. The corps artillery has the medium range and long-range howitzers, as well as guns which are particularly well adapted for the counterbattery rôle and for the isolation of the battlefield.

Employment

The two charts show the characteristics of the principal field artillery weapons. Let us review briefly their usual employment. The horse-drawn artillery is out. It was a lot of fun in peacetime, but has no place on the modern battlefield. Some pack artillery will remain. It is expensive in manpower, space, and labor, and is not needed very often. When it is needed, it is needed *urgently, and nothing else can do the same job.* Airborne units are equipped with the same weapon, but it is deficient in range and hitting power for this mission. All other types of artillery are now both towed and self-propelled. There is a tendency toward the self-propelled mount in the future, for ease and speed of going into and out of action, and, in the heavier types, for decreased shipping and road space and economy in manufacture. Limiting factors on this trend are: the requirements for economy in use of motor fuel, for heavier bridging equipment, and for air transportability.

The 105mm howitzer is the standard, light, direct support weapon. We now have both four- and six-piece batteries, with consideration being given to standardization on the six-piece formation. There are three battalions in each infantry and armored division. The 155mm howitzer is a tremendously versatile weapon. Its characteristics are similar to the 105 but it has a greater range, and a greater weight of metal and explosive in its projectiles. It has been considered for the rôle of direct support, and is accurate and effective on all types of missions at ranges up to 16,000 yards. It is a fine corps artillery weapon for all missions, especially that of reinforcing the division artillery. One battalion is organic to the infantry division; and one is being considered for inclusion in the armored division.

In addition to the above, we find in the corps artillery the 155mm gun, the 8-inch howitzer, the 240mm howitzer, and the 8-inch gun. The guns are high velocity weapons, and are not economical on close support work except for destruction of vertical targets of small size, but are good for counterbattery fire and isolation of the



		75mm HOW M8	105mm HOW M2A2(T) M37(SP)	155mm HOW M1(T) M41(SP)	8" HOW M2(T) M43(SP)	240mm HOW M1(T) T92(SP)	155mm GUN M2(T) M40(SP)	8" GUN M2(T) T93(SP)	ROCKET LAUNCHER T66
WT OF PIECE & CARRIAGE IN TRAVELING POS (TONS)	T	72	24.9	6.35	14	HOW 23.96 CARR 25.55	15.05	GUN 26.31 CARR 25.55	.64
	SP	—	19.75	21.5	41.5	64.5	41.5	67.0	—
TIME TO EMPLACE (MINS)	T	3	3	5	30 to 360	60 to 360	30 to 360	60 to 360	2
	SP	—	1	1	1	5	1	5	—
WEIGHT OF PROJECTILE (LBS)		14.7	33	96.1	200	360	95.1	240	42
RATE OF FIRE (RDS/MIN)	MAX	6	4	3	1	1	1	1	16
	NORM	3	2	1	1/2	1/2	1/2	1/2	16
EFFECTIVE AREA OF BURST (YDS)	LATERAL	30	50	60	80	100	60	80	50
	RANGE	10	15	18	20	25	18	20	15

References: TM 9-2300, 7 FEB 44 and appropriate TM's
(Effective area of burst FM 6-40, 1 JUNE 45)

battlefield. The 8-inch howitzer is a remarkably accurate piece, and is a prime favorite with all who have used it.

Old Concept Ridiculous

The old concept of heavy corps artillery was that of a weapon which was cumbrous and slow-moving, which took days to emplace, and was brought into action days after the battle was joined, when the divisions had met organized resistance that had to be destroyed by "siege guns." Two incidents from the past war will illustrate the distance we have advanced from such a concept. One May morning an infantry battalion commander was ordered to capture a certain hill. He issued his orders, deployed his battalion, and advanced to the assault. Several hours later his troops, hot, dusty, and tired, reached the far side of the hill—where they found an 8-inch howitzer battalion in position, firing merrily at the enemy. At another time, the commanding general of a certain armored division registered a very heated protest. The reason was that a heavy artillery unit, in going into position, had been so atrociously badmannered as to cross his route of march, and in the process had cut the advance party off from the point of his advance guard!

In the corps artillery, the field artillery observation battalion is organic. Its heaviest weapon is the Bazooka, but it is the eyes and ears of the corps artillery, and the corps can't do business efficiently without it. With its flash-ranging, sound-ranging, and radar-ranging equipment, it can produce locations of enemy artillery when no other agency can. Its meteorological and survey sections furnish data which permit accurate fire when observation is impossible.

The Past

It appears that the outstanding progress in the artillery during the past war has been in the development of the tactics of the reinforcing corps artillery, and in the process of pulling such units into that "close-knit fighting team." Twenty years ago there were many good batteries, but few battalion commanders had the opportunity to train their battalions as such. In the 1930s the development of the battalion fire-direction center began to pull battalions together as units. Soon thereafter division artilleries began to take shape, and in the immediate prewar and early war years, and especially in the large-scale maneuvers of that period, the battalions of the division artilleries and their supported units began to develop their teamwork. However, the great mass of corps artillery battalions and their higher headquarters had no opportunity to learn their combined team play until they reached the battlefield. This is a serious, hard-learned, and costly lesson which must be kept in mind by commanders of all arms at all levels during the postwar training years.

The Future

What the future may hold, no man can foretell with assurance. The merger of the seacoast, antiaircraft, and field artillery into one artillery arm is already being planned. It should result in a broadening of knowledge and vision on the part of all artillerymen. It must not result in any decrease in technical skill on the part of any artilleryman. As to weapons, rockets are still in their infancy and already have proven their worth in battle. Jet propulsion, atomic warheads, atomic propellants, new fuels, new power plants for vehicles, guided missiles, all, with many others, known and unknown, will materially affect the artillery. But whatever its nature, cannon will always be essential on the battlefield, and its missions will continue to be to gain supremacy over the enemy's weapons, to isolate the battlefield, and to assist the assault forces in the destruction of the enemy.

New Regular Cavalry Officers

Seventeen Cavalry officers were among the additional 900 officers appointed in the Regular Army on August 28, 1946. These are in addition to those that were appointed in June.

The permanent rank to which they were appointed in the Regular Army appears before their names while their temporary ranks appear after.

2d Lt. James C. Vaughn (1st Lt.)
2d Lt. Kenneth W. Ramussen (2d Lt.)
1st Lt. J. R. Abernathy, Jr. (Capt.)
1st Lt. William S. Miller (Lt. Col.)
1st Lt. Harry G. Sanders (Major)
Capt. John J. Prokop, Jr. (Capt.)
1st Lt. Donald C. Felton (Lt. Col.)
Capt. Charles R. Keasey (Lt. Col.)
2d Lt. Richard E. Stanley (2d Lt.)
Capt. Charles H. Hayhuff (Lt. Col.)
Capt. Donald F. Gibbons (Major)
1st Lt. Harold D. Woodruff (1st Lt.)
1st Lt. Edward J. Vincent (Capt.)
1st Lt. Robert J. MacDonald (Major)
1st Lt. Paul A. Baltes (Capt.)
1st Lt. Henry R. Howell, Jr. (Major)
1st Lt. Alfred Yorston, Jr. (Capt.)

INFANTRY

Cooperative Training

*Infantry and Armor**

PRIOR to and during World War II, much was written about the need for coöperative training among the various types of combat arms. It was a generally accepted principle that Infantry, Artillery, Armor, and Air Corps should all know how to work together. In spite of this accepted principle, however, units that were insufficiently trained in working with other units frequently entered combat. Practically all reports from the fighting fronts emphasized the necessity for coöperative training of all types of units. In some instances, these reports were specific with regard to the points to be covered; in other instances, the reports were merely general statements which cited the need for coöperative training.

In the paragraphs which follow, the sentences in italics have been extracted from WD Pamphlet 20-17, "Lessons Learned and Expedients Used in Combat," and bear either directly or indirectly on the subject of coöperative training of infantry and armor. By closely examining these statements from combat veterans, it is possible to draw certain definite conclusions as to the value and scope of coöperative training.

"Leadership is based on knowledge. First, every officer and enlisted man must know his job; . . ." (This) *"is obtained in training; . . ."*

Whereas most military men readily accept the truth of this quotation, the fact is often overlooked that the knowledge itself must necessarily include a great deal of familiarity with the tactics and technique of supporting units, or of units that are acting in a supporting rôle. This knowledge can be obtained in many ways, but, primarily, it is acquired by practical work and training with the different types of units. Every officer and enlisted man is expected to study War Department field manuals and other publications in order to acquire the basic elements of knowledge. *"Remember the little things make or break you in battle. Don't pass over your Field Manuals and Army Regulations lightly; all the materials you need in battle is included in them. It is up to you to dig it out."* By thorough study, the military man learns through the experiences of others, but this study can become of value only by practical application of the principles learned. As the leader studies, he puts his knowledge to a practical test by working in the field, first with his own unit, then with his own unit as part of a larger unit, and finally with his own unit combined with units of other arms. Because of the importance of armor in present day warfare, it is essential that infantry and armor take part in coöperative training. They thus will learn to work together. This training is so much a part of practical knowledge, that, if leadership is based on knowledge, axiomatically, leadership is based on coöperative training.

"False alerts tend to make gun crews skeptical. Some units regard any tracked vehicle as a tank, and promptly report it as such. This destroys the efficiency of the warning system. Front-line troops should be thoroughly familiar with identification of enemy armor."

Although this quotation applies primarily to enemy armor, is is necessary for personnel to learn to identify vehicles of our own units, as well as those of the enemy. The best way to teach troops the difference between a tank and an ordinary tracked vehicle is to show them the actual vehicles. Such a demonstration should be one of the first steps in coöperative training. The armored unit should furnish vehicles and personnel to train the infantryman, and the subject should be covered in such a way that the infantryman will be able to recognize by sight, sound, or silhouette, all of the common types of friendly armor. He should also be able to tell at a glance the difference between a tank and a half-track, or a light tank and a medium or heavy tank. By thus becoming familiar with the armored vehicles of his own Army, the infantryman, to a certain extent, automatically learns to identify enemy armor, and at the same time, he learns how to differentiate between the common types of enemy armor. Although it is true that he may not be able to differentiate between a German Mark IV or a Mark V, he at least will be able to tell whether the vehicle in question is an enemy light or heavy tank or an enemy half track.

While the infantryman is learning to identify armor, the tanker should be given an opportunity to examine infantry weapons and other important items of equipment. He should hear the various infantry weapons fired while he is near the location of the gun, and later

*From The Infantry School.

while he is near the point of impact of the weapon being fired. In this way the tanker will learn to recognize infantry weapons by sound. He should also be given training in identifying friendly infantrymen at a distance. Some of this training should be conducted with the tanks buttoned up and in motion so that the tanker will learn to identify friendly troops and weapons in spite of the noise and restricted vision.

"Every soldier should be given a ride in a buttoned-up tank to show him the limited vision and field of fire, and the closed-off feeling of the tankers. It will do much to counteract the dread of a tank attack, and will increase faith in his own ability to resist one."

Although this quotation is specific as to one small point of training, it bears on a subject which is an important part of training—the capabilities and limitations of different weapons and units. Infantry should understand the capabilities and limitations of armor—and armor should understand the capabilities and limitations of infantry. This is a training subject which can be easily arranged and which can be both interesting and highly instructive to the participants. Armored personnel, when used to instruct infantry, have an opportunity to do worthwhile boasting about the strongpoints of their equipment; also they have an opportunity to inform the infantryman of their weak points and thus seek from him the coöperation and protection which is often necessary to make an armored attack successful. This instruction should cover the ability of tanks to cross various types of terrain, the ability of the tank crew to see and hear, and to aim and fire their armament while at a halt and while moving. It should also cover the difficulties involved in the resupply and maintenance of tracked vehicles, and the capabilities and limitations of tanks in the daytime and at night. Another point which should be emphasized is the invulnerability of armor to small-arms and time fire. All the points mentioned above should first be explained to the infantryman. He should then be allowed to examine all of the equipment closely. He should be permitted to fire the weapons and to ride in a tank, and possibly even drive one for a short distance. He should ride in a tank through a dug-in infantry position so that he will see how safe an infantryman is against tank attack when he stays in his hole and refuses to run. This phase of the training should be followed by actual demonstrations of all of the points mentioned, so that the infantryman can see with his own eyes the exact capabilities and limitations of these steel monsters.

The Doughboy should be used in the same manner to train the tanker in the capabilities and limitations of infantry. During this period, the infantryman has his opportunity to boast about the many things that he can do well. At the same time, he has an opportunity to explain to the tanker the things which the infantryman cannot do, and for the accomplishment of which he needs armor to help him. In this training the tanker is shown the characteristics of the principal infantry weapons. He learns the types of location from which they are fired, the ranges at which they usually fire, and the effect of the various weapons on armor plate. He becomes familiar with the methods which infantry uses to combat armor, and the best ways in which to guard against these methods.

As a final phase of the training in capabilities and limitations, the infantry and armor should give short demonstrations for each other which will show the usual tactics employed by their respective units. These preliminary demonstrations should not be in the nature of combined problems, but rather in the nature of a starting point for the more advanced study of tactics to follow later. The demonstrations should be comparatively short, and cover only the more elementary tactical principles. In these first problems the infantry might demonstrate a rifle platoon and company in the attack and in the defense. Similar demonstrations should be given by armor.

"Infantry should be 'married' to the tanks to an extent that one tank company and one infantry company are blended as a unit. . . . The infantry platoons sleep and work with the tank platoons."

This quotation emphasizes the most important part of any coöperative training. In this phase the infantry and armored units should be employed together in the field as definite teams. If possible, the units should be blended together no higher than the company level. Their problems and exercises should be planned to cover all possible phases of technique. To teach technique, squad problems should be planned which involve the use of a rifle squad and a single tank section for clearing a woods, eliminating a strongpoint, or reducing a roadblock. These problems should be followed by platoon problems involving the use of a rifle platoon and a section or platoon of tanks. Infantry and tanks should practice different formations, and should learn when to use each formation. The primary point emphasized in all problems should be coöperation between the two arms. Such training will bring to light many points which must be worked out before the units can function satisfactorily as a team in combat. The Doughboy will learn to point out to the tanker the obstacles to be avoided and the targets on which to fire. This means that the infantryman and the tanker must work out a reliable method of communications. The tanks should have a telephone on the outside so that an infantryman can talk to the tank commander. An AN/VRC3 (300 series) radio with the tanks will make it possible for the infantry company commander to talk to the tanks by means of his 300 radio. Also, a liaison radio car at battalion headquarters will enable the infantry battalion commander to exercise control over the tanks.

The infantryman will learn that when he has tanks supporting him he must protect those tanks. Likewise, the tanker will learn that he cannot advance too rapidly without sacrificing the protection furnished him by the slower Doughboy against Bazookas and antitank guns.

There will be times when the infantrymen can ride on tanks. There will be other times when infantrymen cannot be too close to the tanks without suffering heavy casualties from artillery and mortar fire. The infantryman will learn to be observant for antitank mines, and at the same time he will learn to walk in tank tracks in order to pass safely through an antipersonnel mine field. *"Regardless of the initial formation, it is not essential that tanks and infantry keep their respective positions throughout an assault. A tank must stop to fire effectively, and that is the time for the infantry to press on. Both arms must realize the fact that if one stops, that is not a reason for the other to stop. When tanks are canalized by difficult terrain or are held up by mine fields, it is necessary for the infantry to precede the tanks. The tanks, however, must continue to give the infantry fire support, backing up to high ground, if necessary, to keep the infantry in view."*

Coöperative training, in order to be successful, requires work, planning, and a spirit of coöperation on the part of both infantry and armor; however, the training is vital and must be done in order to attain success in combat.

Only by real coöperative training will units be able to render reports such as the following one from the European Theater of Operations: *"We rode eight men on a medium tank and six on a light tank, all on the rear deck. We first sent out a wave of tanks buttoned up, put time fire from the artillery on them, and followed with the tanks carrying the men. The artillery observer rode with the leading wave and controlled the fire, setting his fuzes a little high. To insure control by the infantry CO and the tank CO, I put them both in the same tank. The infantry CO hung his SCR-300 on the outside of the tank, and worked directly with that part of his battalion which followed. Infantry company commanders could talk to tank platoon commanders by telephones hung on the back of the tanks. We fought this way for eight days and nights, and the foot soldiers loved the scheme. A disadvantage: It fails to use most of the crew-served weapons. We are going to try to utilize the heavy weapons company by riding it on tanks."*

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ORDNANCE DEPARTMENT

DEVELOPME
AIRBORNE 40m

by Major Tho ma

There are more than 1,800 different weapons and pieces of equipment supplied by the Ordnance Department to the Army. Of these more than 1,600 were new, or received major improvements during the war. . . .

. . . One man may have an idea, but it is the work of many men and organizations that finally produces a weapon which meets the needs of the arm that uses it. . . .

. . . The process of developing a new weapon and how it is standardized, which is outlined in this article is not widely known, and should prove illuminating. . . .

A NEW weapon does not spring full-blown from the mind of some harried inventor. One man may have an idea, but it is the work of many men and organizations that finally produces a weapon which meets the needs of the arm that uses it. Ideas come from many varied sources: the soldier in the field, tactical requirements, scientific organizations such as the National Defense Research Council, manufacturers, and the Ordnance Department, to name a few. Comparatively few new ideas come from amateur inventors. During the war, ideas from this class of inventors were screened by the National Inventors Council, and any that seemed promising were forwarded to the Ordnance Department.

Examination of Inventions

The National Inventors Council did a magnificent job. An idea of its magnitude can be gained from the following figures. From its inception in August, 1940 until December 31, 1945, there were 202,625 inventions submitted to the Council. Of these inventions 67,541 pertained to Ordnance subjects. After careful review, 2,471 were submitted to the Ordance Department for action, since the Council was not familiar with all the latest developments, many of which were highly classified. About 90 per cent were rejected for various reasons such as duplication or impracticability. The remaining 241 were tested, or received special treatment. As a result, 37 were adopted by the Ordnance Department for use. None of the 37 was a new weapon —all were improvements on weapons in use. This does not mitigate their importance, since these improvements —such as a new sight for the Bazooka or a feed mechanism for a gun—cannot arbitrarily be measured.

As may be seen, every avenue for new or improved weapons was explored. The majority of useful ideas, however, came from the Army, which was natural.

Ideas From Field Encouraged

During the war, the Ordnance Department sent three publications directly to the men in the field to glean any ideas they might have, and to inform them of improvements, or of improvisations that were used by others.

These magazines answered their questions, and the Ordnance Department adopted many suggestions that were made for improvements. "Army Motors" dealt with tanks, combat vehicles and trucks. It informed Ordnancemen of new tricks of which they could take advantage, and published letters and articles from men in the field.

"The Ordnance Sergeant" was slanted principally toward all equipment other than automotive.

Firepower the Ordnanceman's Journal, was a magazine of general interest.

On the masthead of each of these magazines was a statement that all Ordnance personnel was encouraged by the Chief of Ordnance to contribute articles and matériel of interest to other Ordnancemen. These articles were sent directly to the magazine and not through "channels." Thus they allowed the greatest freedom of expression, with the assurance that the suggestions or ideas contained would go directly to the appropriate development division for consideration.

1,800 Weapons

There are over 1,800 different weapons and pieces of equipment supplied by the Ordnance Department to the Army. Of these more than 1,600 were new, or received major improvements during the war. The process of developing a new weapon and how it is standardized is not widely known and should be illuminating.

Airborne Infantry was one of the new tactical developments of the war, and necessitated the use of weapons especially designed for carrying in planes and gliders. These troops needed weapons for both offense and defense. One weapon of defense was the 40mm antiaircraft gun which was used against low-flying planes or ground troops.

The Airborne Command did not specify the exact weapons it needed—with dimensions and weights—it merely stated that it had to have an automatic antiaircraft gun similar to the 40mm M2A1 (Bofors). This is an automatic weapon that fires 40mm shells in clips of four at the rate of 120 per minute. Principal dimensions of this gun in traveling position are: length, 225 inches; width, 72 inches; height 79½ inches. Weight is 5,549 pounds. This gun travels on a four-wheel carriage and was much too big to enter any of the cargo planes then in use, in 1942.

★Ordnance Department.

ENT OF THE 0mm AA GUN

*Thomas G. Gentel**

Specifications called for a gun that could be transported by a C46, C46A, C47 or C54 plane. A major job of redesigning was called for . . . and it was accomplished.

Steps In Redesigning A Weapon

In the Ordnance Department there is a little known committee, but it is one of the most important in the entire Army. It is the Ordnance Technical Committee, and its members are responsible for the weapons used by the Army. They approve or disapprove all new developments, and standardize those weapons that they feel should replace a weapon in use, or should be included as a new weapon. The committee is composed of representatives of all the using arms, including the Navy and Marine Corps, and of the different Ordnance services. During the war, representatives of the British and Canadian Army and Air Forces participated in all the meetings. It was this complete coördination that insured only the best weapons for issuance to our troops. Once each week the committee meets. Each item to be presented is called an OCM (Ordnance Committee Minute), and is prepared by the development division that is responsible for that particular weapon. In the Ordnance Department the Research and Development service has seven development divisions: Tank and Motor Transport, Artillery, Rocket, Ammunition, Small Arms, Aircraft Armament, and Research and Materials. The latter division covers fuels, lubricants, ballistics, various materials, and specifications. The Ordnance Department is divided into four services: Research and Development, Industrial, Field, and Military Plans and Training. Each of these also have representatives on the committee. Every OCM is signed by the representative of the using arm interested in that particular weapon, as well as by those divisions and services of the Ordnance Department that are responsible for the production of the weapon or its components. For instance, when a new gun is developed by the Artillery Development Division the Ammunition Development Division must develop new rounds for it, and since new ballistics must be calculated the Research and Materials Development Division also enters the picture. Further, the Industrial Service is interested in determining whether or not the gun can be readily serviced and repaired in the field. Thus the development of any new weapon is not a one-man show.

On August 28, 1942, an OCM was read before the Committee that recommended the development of an airborne automatic 40mm gun, utilizing as many as possible of the features of the standard 40mm antiaircraft gun. This OCM was approved by the Committee and signed by representatives of the Coast Artillery Board (antiaircraft defense is assigned to them), Air Corps, Air Ordnance and the Ordnance Department.

Preliminary sketches had been made prior to the meeting and work was started as soon as the OCM was approved. Drawings were made, and a contract let to an industrial firm. The firm was manufacturing 40mm mounts, and so was familiar with the problems to be solved. Two pilot models were built so that simultaneous tests could be made both at Aberdeen Proving Ground and the Airborne Command at Fort Bragg.

Pilot Models Exhaustively Tested

The first pilot model was shipped for testing to the Aberdeen Proving Ground late in November 1942. In January 1943 the other pilot was shipped to Fort Bragg for tests and from there to Camp Davis, Headquarters, for the Antiaircraft Testing Board. As a result of the tests, certain modifications were recommended and were incorporated in the manufacture of two slightly different models. Eight of one model and 10 of the other were manufactured and shipped to the North Africa and the Southwest Pacific Theaters of Operation for combat use in the spring of 1943.

The mount bore very little resemblance to the original 40mm Gun Carriage M2A1 after the various changes had been made. The top carriage of the M5 Carriage is similar to that of the 40mm Gun Carriage, M2A1, except for minor modifications to the platform and foot rests, which reduce the width of the mount sufficiently to permit its passage through the doorway of a plane.

The chassis consists of a center base with one permanently attached outrigger, and three removable outriggers which may be fastened to the mount by brackets and tapered wedges. Each outrigger has a leveling jack. In traveling position, the side outriggers are removed and hung by steel straps to the rear outrigger, or

are carried separately. Individual right and left wheel assemblies for maneuvering the mount are attached to each side of the base in place of the outriggers.

The New Weapon

The wheels are of the airplane type with 7.25 x 11.50 plain tread airplane tires inflated to 50 pounds pressure. No system of spring suspension is used. Airplane-type mechanical brakes, operated by a lever and cable, are fitted to each wheel.

Before loading the carriage into a plane, it is necessary to remove the gun barrel and the detachable outriggers. The carriage can be unloaded from the plane and moved for short distances by manpower, or be towed behind any prime mover. Three men can emplace the carriage in approximately five minutes, and can raise it from firing position to traveling position in approximately eight minutes.

Principal characteristics are weight in traveling position, of 3,480 pounds (detachable outriggers and barrel removed). Over-all dimensions in traveling position are: length, 118 inches; width, 56 inches; height, 76 inches. Total weight is 4,495 pounds. Compare these characteristics with those for the standard M2A1 carriage and it is apparent that a major redesigning job was done. Rates of fire are the same as for the M2A1; traverse, 360°, and elevation, from −5° to 90°, are also the same.

On August 2, 1943, the experimental models were standardized as the 40mm Gun Mount, M5, and immediate procurement of 200 was authorized. In a little less than a year a new weapon was designed, tested and standardized.

The development of this weapon is relatively uncomplicated when compared with the steps required to build a new tank. Tanks and other vehicles used by many arms require a much wider coördination. For instance, the Corps of Engineers prescribes definite limitations on the characteristics of vehicles, such as weight and size, which are dictated by the bridges they erect.

Also to be taken into consideration are the facilities for loading and unloading at ports in this country and in the theaters, the capacity of the winches on board ships and their hatches and holds. Railroad and highway bridges and tunnels are also restrictive factors.

The final weapon is a masterpiece of compromise when one considers the various physical limitations imposed on its design and the varied requirements of the different using arms.

Mission of the Ordnance Department

The mission of the Ordnance Department is to develop, design, procure, store, maintain for and supply to the Army such equipment and supplies as are assigned to the Ordnance Department for procurement, in such quantities and at such times as are required; and to train and to furnish specialized Ordnance troops as authorized to Zone of the Interior installations and units of the field forces.

The major types of items procured by the Ordnance Department are tanks, self-propelled mounts, motor combat and transport vehicles, artillery and its ammunition, fire control equipment, small arms and their ammunition, bombs, grenades, pyrotechnics, land and submarine mines and their equipment, rocket launchers, and spare parts therefor. In addition, the Ordnance Department will procure other matériel, raw materials, ingredients and facilities, including machine tools and other tools and equipment, necessary for their production and maintenance.

". . . Misunderstanding of cavalry's value and function might, perhaps, be traced to one of the early tragedies in the First War. The English had not yet learned the new rules of the game and, as is customary with democracies, they were terribly short of men. In one of the desperate attempts to hold back the German army a cavalry regiment was ordered to charge. It was the futile and heroic and impossible effort of the Six Hundred brought up to date. . . . The immediate deduction was: 'Cavalry has no place in modern war.' The truth is, of course, that the cavalry had been misused. In the American Army there have been generals who maintained that fact, in season and out of season, with all the energy that 'Billy' Mitchell gave to his crusade for the flying arm. They have asserted that in modern war the cavalry has as definite a place as the dive-bomber or the tank."—Herbert Corey in *The Army Means Business.*

ARMY AIR FORCES

The Gallant Little "L" Plane Had Versatile Uses in World War II

by Charles Villency

THEY were nicknamed "the little planes with the BIG PUNCH" by the Army Air Forces men who knew what these planes could do. These were the "L" planes, the liaison aircraft that were light enough to make maneuverability a minor problem but capable of performing functions which were never found on any activation chart in World War II. Officially their mission was liaison work; actually they were cargo carriers, ambulance planes and even bombers.

Usefulness of the liaison plane was proved during the war in all theaters of operation. Today it maintains its place in the Army Air Forces as a versatile aircraft. A number of new models have been developed since the war, but their function remains generally the same.

For instance, one of the new liaison aircraft, the L-13, has been designed primarily as a liaison and utility plane that will take off or land in a short area with heavy loads. It is an all-metal job of 2,900 pounds gross weight, powered by one 245-horsepower geared Franklin Model XO-425-5 air-cooled engine, and has radio equipment excelling that of any communications and navigational apparatus heretofore put into liaison aircraft.

Normal crew and passenger provisions are for one pilot, one observer and one litter patient. An alternate arrangement will accommodate two litter patients, and a special seating arrangement will allow an overload of one pilot and five passengers.

The cold statistical facts about the "L" plane's construction cannot convey the drama that so often was coupled with their use in World War II. There is many an Air Forces veteran who can truthfully say he owes his life to this small plane.

Back in the days when the Japs were holding on tenaciously to their gains in Burma, the little liaison planes had more than their hour of glory. There's the story of one liaison pilot whose outfit had been operating right under the noses of the Japs for six months, evacuating wounded, carrying supplies, doing reconnaissance and performing a variety of other functions in support of the ground troops who were fighting deep in the jungle country. Assuming that the ground forces could have marched safely to the nearest medical aid station, it would have taken them at least two weeks to batter their way through the jungle. But the liaison planes made the trip in a couple of hours.

It wasn't until the spring of 1943 that the first liaison squadrons went into combat, but that was not their official mission. Actually they were to provide theater and task force headquarters and ground force units with general liaison, messenger and courier service in areas behind the front lines of the enemy troops. They performed these functions and a host of others besides, as AAF historical records show.

The liaison planes performed along lines that were considered impossible. For instance, two 14th Air Force officers actually flew the Hump in liaison planes, a procedure that originally had been frowned on when the question came up as to the best method of moving these planes from India to China. Although they had been told of the difficulties of hopping over the towering Himalayas, Major Fred Welsh and Captain Edward Maher undertook the flight in a pair of L-5s.

They took off from a base in Assam and landed at an advanced field in China. The men reported they got as high as they could—9,000 feet—and made most of the mountain passes. They were forced to drop to 300 feet some of the time, just skimming treetops. And though they had to fly single file through the main pass of the Hump, they got through.

Liaison planes played several rôles in the China-Burma-India Theater of Operations. In Burma, back in 1944, there were two separate light plane operations. One squadron, attached to the 10th Air Force, supported Merrill's Marauders and Chinese-American units in India. Another light plane force operated with the Air Commandos, directed by Colonel Philip Cochran and Colonel John Alison. Activities of this commando unit were in conjunction with operations directed by the late Major General O. C. Wingate of the British Armed Services.

General Wingate attested to the usefulness of the "L" planes with warm words of praise after an operation which saved the lives of many British troops. Surrounded and trapped in the Arakan section in southern Burma, the British troops faced annihilation by the Japs. Many were wounded and had no way of getting out of the jungle fastnesses. Liaison planes received a call for aid. Seven light planes and nine sergeant pilots were dispatched, and in 15 days they evacuated 700 casualties. That mission was considered so important by the British that they provided Spitfire cover for the light planes. However, the liaison planes never had any fighter protection in later operations. General Wingate

later told the Americans that "without your men and your aircraft, this campaign could not have hoped to be a success."

The light planes flew into places where larger aircraft feared to operate. A problem otherwise unsurmountable lay in keeping supplies flowing in to the ground troops who were completely isolated in the jungles. Teaming up with C-47 Skytrains, liaison planes accomplished the job. The larger transports flew to the large back bases with a full load of supplies while the light planes distributed this matériel to the small advanced outposts interspersed through the jungle.

Liaison pilots had no snap job, because the Japs knew the value of the small aircraft and did everything to stop them. One pilot got away with 21 holes in his plane. Many times the enemy occupied both ends of the same landing field so as to cut off the liaison planes. Frequently the liaison pilots had to fight the Japs for possession of their planes. On one occasion, the Japs captured some of the liaison planes, so the pilots became ground troops, joined the British and recaptured the aircraft.

Colonel Cochran, hero of the African and Burma campaigns, declared the liaison planes "did one of the finest jobs I have ever seen."

"Our light planes did everything," he said. "They evacuated wounded, served as cargo carriers, transporting everything from barbed wire and bedding rolls to mortars and mortar shells. We used them to help direct our ground activities, to observe enemy movements. A couple of times we made bombers out of them and got excellent results. If we needed to round up the ranking officers from various points in the jungle for important conferences, the light planes did the job."

Three types of planes—the L-1, L-4 and L-5—were used for these operations. Each liaison squadron had seven officer pilots and 32 noncom pilots. In the operations in the CBI and elsewhere, the AAF light plane activities were separate from the use of liaison aircraft by the artillery. AAF liaison squadrons were attached to the various Air Forces where they could be assigned to the ground force units for over-all liaison functions. Their planes were piloted by Air Forces personnel, while artillery liaison planes were flown by artillery personnel and were used only in connection with artillery operations.

An L-5 hugs the mountains in China as it goes out on a mission over the Salween front. It faces dangers from the enemy as well as uncharted mountains.

Air Forces Photo

If skepticism meets the statement that liaison planes could even serve as bombers, here is how it was done: The Commandos in the CBI attached 100-pound bombs to the wings of the L-5 and a 250-pound bomb to the belly of the L-1 (in late 1944 this plane was no longer in production), and bombed the enemy from low altitudes. On one occasion, a force of Japs took cover under a bridge and fought a strong delaying action from their protected position. Two men took off in an L-5, equipped themselves with hand grenades, swept down on the top of the bridge and tossed their grenades out of the doors at the enemy under the bridge.

The liaison planes did yeoman work in reconnaissance. They worked in close coördination with advancing ground forces by reconnoitering the terrain and dropping notes to the advancing columns with information concerning the Japs' strength and position. Light planes kept a close and constant watch on all trails leading into the landing strips to detect existence of any enemy patrols. Light planes also were used to spot targets for bombers. One man sat in back of an L-5 with smoke bombs which he tossed overboard when the plane flew in at zero altitude. The heavy aircraft then bombed on the smoke.

Evacuation of wounded forms part of the proud record of the light aircraft. While the L-1 and L-5 normally carried only two men each, in response to an emergency situation it was not unusual for the L-5 to carry three and the L-1, four passengers. Sometimes the L-1 even carried five men. There was no other way to bring out the wounded from the jungle, Colonel Alison reported at the time.

"The men were very glad to sacrifice comfort for safety," he said. "A wounded man behind enemy territory is a worried man. The knowledge that the light planes were evacuating the casualties was a great help to general morale."

Although the official specifications of the L-5 indicated it was built to carry about 250 pounds of cargo, actually the normal load was often twice that. The liaison planes carried supplies attached to each wing and, when no landing fields were available, dropped the matériel to the troops below by parachute.

The "little planes with the BIG PUNCH" accomplished their missions and more. The pilots who flew them are proud to have taken part in such gallant performances.

MEDICAL DEPARTMENT

Medical Care in Combat*

THE Army Medical Department watches over the health of the soldier from the time he is inducted until he is discharged. An outstanding example of this care is the treatment the wounded soldier receives during combat. Here treatment and evacuation combine into a near-perfect medical service organization and may best be understood by following an injured soldier through the "normal" chain of evacuation.

Medical treatment begins as soon as the soldier becomes a casualty. Many a soldier has stated that he received medical care within minutes after he was wounded. From that point on, his evacuation may be compared to a medical conveyor belt.

Every soldier is trained in the principles of first aid and carries with him in battle the things he may need in such emergency. If his injury is too serious for him to help himself, medical aid men are there to give him first aid where he falls and litter bearers carry him to the battalion aid station located a few hundred yards from the front lines for emergency surgery and medical care. These aid stations are usually located so that they can be reached by following the "lines of drift," by some means of markers either natural or improvised and move to new positions each time fighters advance.

Here the first real medical attention is given by the Battalion Aid Surgeons and their assistants. Supplementing the first aid given by the medical aid man, any bleeding is stopped, dressings and splints are applied, pain is relieved by morphine, and shock is counteracted by plasma and whole blood, as well as opiate. Plasma is used in the treatment of shock to render the casualty transportable and help preserve life until a hospital can be reached; whole blood is given to prepare the man to withstand life-saving surgical procedures. At the battalion aid station the decision is made whether the wounded man should be returned to combat or moved on along the chain of evacuation by ambulance, jeep or litter to the collecting station which may be a few hundred to several thousand yards from the front. This also is only a stopping point where the wounded are sorted into groups that will return to combat and those who will be sent on for more care. Since collecting stations are close to the zone of battle, they take care of both walking and transported wounded. They maintain contact with all division battalion aid stations; their primary objective being to prepare the wounded for transportation to more permanent Medical Department units.

The next stop for the wounded requiring further medical care is the clearing station. These are well-equipped but temporary installations under tentage, serving one division and beyond the immediate fighting area. They have complete surgical equipment, electricity, and full kitchen facilities. Here emergency surgery and treatment is given and the wounded are classified according to type of injury. The wounded soldier remains here for several days, if necessary, until he can be moved again—either back to combat or prepared for transportation to the evacuation hospital. Clearing stations usually are operated in pairs so they can leapfrog to keep up with advancing troops. Each is staffed by 12 doctors and 96 enlisted men and generally consists of 12 tents in a unit.

Set up as near the front as practicable is the evacuation hospital. It is generally found some 12 to 15 miles to the rear and in some cases as far as 50 miles. These are semi-fixed installations usually set up in a school or some other suitable building accessible to auto roads and

A medical aid man tapes up a wounded soldier. Four aid men carried this soldier more than a mile through thick jungle before he could be put aboard a Jeep.

Signal Corps Photo

*From Surgeon General's Office.

airfields. They provide facilities for major medical and surgical treatment of all casualties. In terrain where no buildings are available, these evacuation hospitals also may be under canvas. In this event they are large tents housing from 40 to 60 cots each, and are provided with all the equipment of a modern hospital. A 750-bed hospital of this type is generally staffed by 47 medical officers, one warrant officer, 52 nurses, and 308 enlisted men.

Evacuation hospitals are outstanding examples of the efficiency of organization. So minutely planned are the logistics involved that, upon occasion, these fully equipped, modern medical installations have risen upon barren fields within a matter of minutes. Several instances were reported in ETO of hospitals set up ahead of their Division so that the first men hit by enemy fire found ready and waiting the best medical and surgical skill available anywhere with X-ray and other equipment permitting the most delicate of surgery to be performed immediately.

At the evacuation hospital initial wound surgery is performed. In this stage of treatment the main objective is to prevent infection. The operation termed "debridement" is performed which removes all tissues devitalized and prepares the way for the prompt and successful institution of the secondary or reparative phase of surgery which follows at the base hospital to which the man is removed.

From the evacuation hospital the man may be sent to one of several hospitals, depending upon his condition —convalescent or general hospitals within the theater or the general hospital in the United States.

General hospitals, both overseas and in this country, are fixed installations providing general medical and surgical care. Here the wounded man receives reconstructive surgery, the third and final phase of his surgical care. The commanding general of each theater of operations decides the maximum length of time a man can remain in hospitals in his zone; it may be 30 to 90 days, or more. Men requiring longer care, and those declared unable to perform further duties are evacuated to the United States.

A wounded soldier who continues in this chain of evacuation from the battle front goes from the general or base hospital overseas to an embarkation hospital, and from there is moved by hospital ship or hospital plane to the United States. The hospital ships with an average capacity of 500 patients are complete floating hospitals staffed by about 12 medical officers, 35 nurses, and about 100 enlisted personnel. The planes carried about 24 litter patients, and shuttled back and forth between overseas theaters and this country.

The wounded are landed at debarkation hospitals where they remain only long enough to be routed by plane or hospital train to the appropriate general hospital which specializes in the treatment the individual case requires; the secondary effort being to send each man as far as possible to the hospital nearest his home so that he may be visited by his relatives and friends. Here the wounded man remains until he has received the maximum of medical and surgical treatment going on to the convalescent hospital for that phase of his care. From here the man is eventually recovered sufficiently to be returned to duty or discharged to civilian life.

Signal Corps Photo

Ninth Army aid men give assistance to German prisoner shot in the stomach.

All along the line of this medical conveyor belt the soldier has received treatment. His spirit has been developed and he has put his dependence on the doctors and nurses. He has seen others with possibly more serious wounds get well. He learns to take the loss of an arm, leg, eye or disfigurement in his stride. He believes he will soon be well to do a job and has complete confidence in the doctors and nurses and that he is given the best care that medical science can provide. That this confidence is not misplaced is shown by the fact that almost ninety-six out of every 100 wounded who reached hospitals survived. This record has been accomplished by a vigilant, aggressive medical policy which has resulted in the advancement of medical science by many years. Many of these new methods of medical and surgical treatment have already been passed on to the public.

MARINE CORPS

Marine Tank Lessons Learned at Guadalcanal, Bougainville and Tarawa

by John L. Zimmerman and Joel D. Thacker*

Early in the war against the Japs the U.S. Marines learned the importance of mutual support by infantry and tanks. But, they had to learn this important fact the hard way at Guadalcanal.

TANKS were an organic part of the first United States Marine Corps unit to go overseas after the outbreak of war with Japan. The First Marine Division, which landed in New Zealand in the midsummer of 1942, was equipped with five companies of light tanks —the M-3. These tanks actually saw action the second day of the Guadalcanal campaign.

The Marines' first lesson in the use of tanks in the Pacific was learned in the bitter initial fighting of the Guadalcanal campaign on the small islands of Gavutu and Tanambogo, twin islets joined by sort of a causeway, just off the shore of Tulagi. Here, well emplaced, competent enemy troops offered determined resistance to the attacking Marines of the First Parachute Battalion and the Second Marines. Two tanks were assigned to help out the assault.

It was at this point that the importance of close mutual support by infantry and tanks was learned. One of the two tanks had allowed itself to get too far ahead of the troops. It was attacked and burned with ease by the Japs. The other tank operated with its supporting infantry, delivered valuable support in its turn and withdrew successfully.

Ilu, first known as the Battle of the Tenaru, was the next action in which Marine tanks took an important part. It was here that the first great Jap assault on the American perimeter was launched. After a momentary success the Jap attack was stopped and hurled back. The attack had been launched across the sand bar at the mouth of the Ilu River. After being repulsed the enemy had returned to the right bank of the river. The Japs were concentrated in a small area, triangular in shape, bound on one side by the lagoon-like river and on the other by the sea. The area was also heavily overgrown with brush and cocoanut palms. Reports indicated that this force was well equipped with artillery and modern weapons capable of inflicting heavy damage on a light tank.

A platoon of tanks was sent across the sand bar into the enemy concentration to increase the confusion among the Japs, which presumptively had come upon them when they were thrown back with heavy casualties. Two of the tanks were disabled, one by means of a mine, but the crews were rescued. No statement was made in the Final Action Report, whence these details come, as to the effectiveness of the sortie.

The second big attack upon the American perimeter was launched from inland against the southern sector, along a ridge. Coincidentally with the main attack a smaller action was fought on the right flank of the American positions in which both forces faced each other across an open plain, a flat stretch of land had been burned clear by the defenders for the sake of better observation. Each force occupied woodland bordering upon the field. Estimates of the enemy force were about one battalion with artillery. Official account of tank participation in this action follows:

"Tanks were employed against the position, at first with some success. However, the mistake was made in attempting repeated sorties along the same route. Enemy anti-tank weapons were soon put into position and a subsequent sortie was met with close-range fire which destroyed three tanks."

Two things were realized at this point in the operation. First, there was the explicit realization that the

*Historian, USMC.

light tank was an inadequate weapon, that its fire power and its protective armor were insufficient for the tasks normally assigned to tanks. Secondly, there was a growing idea that in terrain of the type in which the actions were taking place, the usefulness of the tank was, and would continue to be, severely limited.

These two ideas were made explicit in the recommendations submitted at the close of the campaign, and which follow:

"Tanks were employed with some success on two occasions. An analysis of these actions indicated:

1. That the jungle is generally unfavorable for tank action.
2. That tanks in small numbers can operate effectively in areas occupied by cocoanut plantations.
3. That the tanks must operate at slow speed and with extremely close infantry support.
4. That wherever possible medium tanks should be employed because of the extreme vulnerability of the light models."

The second large operation of the Marine Corps was that of Bougainville, and here, as in Guadalcanal, a type of terrain was encountered that proved to be the worst possible for the employment of tanks. The participation in action by tanks was limited almost entirely to the task of perimeter defense. Here also, as in Guadalcanal, only light tanks were employed, although the Third Marine Division tank unit—the Third Tank Battalion—included one company of medium tanks, model M4A2. There is no record that this company ever went ashore.

The first action in which it might be said that tanks played an important part and operated in accordance with tank doctrine was the short and violent Betio assault by the Second Marine Division. By this time the division had been equipped with one company of medium tanks from the First Marine Amphibious Corps, who send Company C of the Corps Tank Battalion to New Zealand in October, 1943, for attachment to the Second Division.

The details of the assault on the small, low island are well known. The terrain was more suitable to tank participation than had been that of the Solomon Islands, and the type of defenses which the enemy employed was that against which it was hoped that tanks would be effective.

The two terrain features which caused great difficulties to the infantry likewise proved to be an impediment in bringing tanks into action. The reef which extended roughly parallel to the shore along the landing beaches precluded the possibility of getting the LCD's near the beach proper. It was necessary for crew men to disembark at the reef, wade ashore over the partly submerged coral shelf, and pick out a path that could be followed by the tanks. During this stage of the operation one tank was lost as a result of falling into a hole in the coral.

It will be remembered that along almost the entire beach there had been built a sea wall several feet high, strongly constructed of cocoanut logs. The distance between this wall and the water's edge was only a few feet, and the infantry was, for a time, pinned down in the narrow strip by fire from enemy emplacements inland. There was, at all times, congestion on the beach.

The tanks, once ashore, could not immediately get inland, since the sea wall extended without a break along the beaches where they landed. A means of ingress was provided when a demolition charge blasted out an opening in the wall beyond a point of land on the extreme right of the positions.

Here a difficult decision had to be made by the commanding officer of the company. In order to approach the opening the tanks would have to use one of two paths. The more desirable route lay along the beach under the sea wall, but practically the entire length of the beach was crowded with combat troops, some of whom were wounded. The less desirable route lay through the water and along the uneven partially submerged coral shelf parallel to the beach line, and it was this route that he finally selected. In making the trip, three tanks fell into submerged shell holes, and of the three, only one was salvaged.

Two medium tanks got onto the island and began working inland with the infantry who stayed in close support some fifty yards to the rear. After making some progress, both these tanks became casualties, although only one was totally destroyed. An anti-boat gun damaged the traversing mechanism of one tank, which thereupon made its way back to the beach and set up as a beach defense weapon. Fire from an enemy tank burned the second one completely. One tank of the original group of six was salvaged during the first night and went into action again on the second day.

In the meanwhile, another group of eight tanks landed on the opposite end of the landing beaches, and here again one tank was lost in a submerged shell hole on the coral shelf. The remaining seven found a break in the sea wall and succeeded in getting onto the island, where they supported the advance of the infantry and worked against enemy strongpoints.

The fact that the entire battle took place within a severely limited area and that it was a bitterly contested fight wherein at times the lines were poorly defined makes it understandable that two tanks at least were damaged by friendly fire. A medium tank, in its first advance after getting onto the island, was disabled by friendly mortar fire while later in the fight a second tank was damaged by friendly dive bombers.

Recommendations made at the close of the operation confirmed those made nearly a year earlier at the end of the Guadalcanal campaign. The light tank was once more found to be inadequate both as to armor and armament, and the necessity for even closer coöperation between the tank and the infantry was stressed. It was recommended that one light tank per platoon be equipped as a flamethrower.

TRANSPORTATION CORPS

Army Transportation Corps

*by Lieutenant Colonel Russell F. Oakes**

THE Chief of Transportation is the head of the Transportation Corps and as such is chief transportation officer of the Army and Traffic Manager for the War Department and is responsible for directing, coordinating and supervising all transportation functions for the War Department and for operating such field activities pertaining to these functions as may be assigned to his command by the War Department. The Chief of Transportation is a technical staff officer of the War Department. . . ."

Following the prosaic pattern so characteristic of its official documents, the Army thus capsules its description of the Office of its Chief of Transportation. There is no hint of the toil and trouble, the blood and sweat, the pioneering, ingenuity and resourcefulness, the imagination and determination, the breadth and scope of activities and operations that entered into the discharge of his responsibilities and the accomplishment of his mission during World War II. Nor is there more than a hint, and that imperceptible to all but the initiate, of intricacies and complexities inherent in peacetime responsibilities and activities.

The Transportation Corps is, of course, the Service arm commanded by the Chief of Transportation, and the agency with which and through which he accomplishes his many-faceted mission and his myriad responsibilities. Its peak wartime strength was 403,000, of which nearly 300,000 were military and slightly more than 100,000 civilian men and women. Its current strength, less non-Table of Organization personnel assigned to installations, and to staffs of Armies and Theaters outside the jurisdiction of the Chief of Transportation, is 65,238 military and 44,493 civilian for a total of 109,731.

The Chief of Transportation is coördinator for the War Department with the Office of Commissioner of Customs on all matters of War Department interest, and he is the delegated agent of the Secretary of War for the administration and supervision of all marine personnel affairs of the War Department.

This youngest of the Army Corps was born on July 31, 1942, out of a General Staff decision that full and complete coördination and integration within the Army of all highway, marine and rail transportation activities was fundamental to the successful prosecution of the war. That this decision, translated into policy out of which the Transportation Corps was set up as an "emergency agency," was soundly conceived is illustrated by Paragraph X of War Department Circular No. 227, dated July 30, 1946:

"TRANSPORTATION CORPS. For information of all concerned, it is announced that on February 6, 1946, the Chief of Staff approved the continuance of the Transportation Corps as a part of the permanent Military Establishment. At the appropriate time the War Department will seek the implementing authority necessary to accomplish the establishment of a permanent Transportation Corps."

Illustrative of the continuing efforts of the Army to better coördinate and integrate its highway, marine and rail transportation activities is the transfer, announced as recently as August 9, of functions encompassing administration and operation of all general purpose automotive equipment from the Quartermaster Corps to the Transportation Corps.

Among the types of units affected by the transfer are:

Transportation Corps Truck Company (Heavy), formerly the Quartermaster Truck Company (Heavy). This type of unit operates large truck-tractor and trailer combinations capable of hauling all classes of Army supplies.

Transportation Corps Truck Company (Troop), formerly known as Quartermaster Truck Company (Light) or Quartermaster Troop Transport Company. Equipment employed by this unit consists of trucks commonly known as two-and-one-half-ton, capable of moving supplies, equipment and personnel in smaller quantities and numbers than the tractor-trailer combinations.

Transportation Corps Car Company, formerly known as Quartermaster Car Company, equipped to provide passenger transportation for military personnel.

Specialized automotive equipment peculiar to its own responsibilities and functions, among them mobile bakery, shoe repair, textile repair, fumigating-and-bath, laundry and refrigerator units, remains with the Quartermaster Corps.

The War Department General Order establishing the Transportation Corps came eight months after Pearl Harbor. To the Chief of Transportation it presented the seemingly insuperable task of creating, training and managing an organization destined to embrace more than 400,000 personnel while actually designing, building, increasing and speeding all types of military transportation under his jurisdiction and utilizing to the fullest extent all commercial transportation in his field to bring to bear upon the enemy on distant battlefields

*Transportation Corps.

the full force of America's military might. Out of this congerie of responsibilities and challenges, and aided by few, if any, fortuitous circumstances, sprang the largest integrated transportation system in the world.

To delineate the accomplishments of the Transportation Corps would require volumes. But presentation of at least a few highlights is necessary to comprehension of its place in and importance to Allied victory and future security. They are:

TROOP MOVEMENTS (Zone of Interior)

a. 40,541,261 troops moved by rail and 1,144,399 by bus in organized groups of 40 or more. (December 1941 through July 1946.)

FREIGHT SHIPMENTS (Zone of Interior)

a. 349,071,700 short tons of Army freight shipped via rail, highway and water carrier. (December 1941 through July 1946.)

EMERGENCY CONTROL OF UNITED STATES RAILROADS

a. Assumed control, under the direction of the Secretary of War and the Commanding General, Army Service Forces, of all the railroads of the country at the time of the railroad labor crisis of December 1943 and turned them back to private management in January 1944 without any interruption of operations having occurred and without any financial involvement of the United States.

OCEAN TRANSPORTATION:

a. 8,420,197 troops and other passengers embarked from American ports. (December 1941 through July 1946.)

b. 7,417,001 troops and other passengers returned to the United States. (December 1941 through July 1946.)

THEATERS OF OPERATION:

1. Successfully met all intra-theater transportation requirements of theater commanders.

2. Operated 65 overseas ports of embarkation and debarkation.

3. Military Railway Service (TC) operated 30,000 miles of military railroads, a large part of which (especially in Europe) had to be completely rebuilt and rehabilitated.

4. Operated 46,500 trucks in Motor Transport Service.

5. Operated the famed Red Ball, ABC and XYZ highway express routes to deliver to the front 1,924,006 long tons of supplies.

While these statistics point up the record and provide a clear conception of the Transportation Corps' complex and varied activities and responsibilities; while they explain in a way the fierce pride TC men take in their organization and in their accomplishments, they give little indication of the valor and the heroism that entered into their achievements. They fail to tell of the Port Battalions, the Military Railway Service and other TC troops who left their engines, their cranes, their slings, their hatches and their hoists to pick up rifles or carbines and join Ground Force troops in standing off enemy attacks; they tell nothing of the Negro DUKW operators at Iwo Jima who amazed even the doughty Marines by ignoring withering bombardment in order to maintain a flow of supplies to hard-pressed Leathernecks ashore; nor do they tell of the operation of ports under "buzzbomb" attacks, and of Harbor Craft troops in snub-nosed tugs showing the way to the invasion of the Continent over Omaha and Utah beaches. That glory—and much more—belongs to the men of the Transportation Corps.

But it is the transition from war to peace, and peacetime planning, which now engage the Transportation Corps. Naturally, it is employing means proved wise in war to shape its peacetime ends. The evolution of events already has resulted in the streamlining of both organization and procedures. Installations, among them four Ports of Embarkation which were of major importance during the war; nine Transportation Zones; Holding and Reconsignment Points and other installations superfluous to peacetime needs, have been closed out. The Zones have merged with the Army's field organizations, with each Army commander having on his staff a group of Transportation Officers. Economy consistent with efficient operations, and with progress, has become a "must."

Two major goals constitute the objective toward which this new Corps strives: 1. Provision of efficient transportation service to the peacetime Army and, 2. Creation of superior efficiency in its fields and readiness to meet any emergency of peace or of war. The second of these, of course, embraces the first, but it encompasses much more—"preparedness."

Preparedness in military transportation means creation through aggressive study, research, experiment, education, ingenuity, industry and training of new and better means and methods of moving men and material. It means close coöperation and coördination

Freight cars of the Army Transoprtation Corps pour from the open bow of an LST onto a rail track in France.

between the Transportation Corps and the industries engaged in transportation and the production of transportation equipment; close coördination and coöperation between the Corps and all other Government Agencies, and agencies of Allied Nations, dealing with transportation. It calls for the addition of courses in transportation to the curricula of many schools and colleges, and the provision of extension courses for the Transportation Corps Reserve. And it demands perpetuation of the alertness to responsibility that was so characteristic of TC forces during the war.

It is to the accomplishment of these ends that the Transportation Corps has dedicated itself. Already, through its Research and Development Division, its Transportation Corps Board and the Transportation Corps Technical Advisory Board, which is a hand-picked, representative group of leaders in the nation's transportation industries, it is busy examining every last detail of all captured enemy transportation equipment, and delving into records of enemy transportation methods and procedures. It has sponsored and is very actively assisting experiments with new applications of cycloidal propulsion. In another direction, it is working in cooperation with leading shipbuilders toward perfection of marine electro-coatings developed by one of its officers during the war to 90 per cent effectiveness in protecting a ship's hull from rust and other corrosives; and toward perfection of an electrolytic cleaning process, developed by the same officer, which is expected to outmode "chipping." Perfection of these methods would be of vast economic significance to commercial as well as to military shipping.

The Transportation Corps has developed a far-sighted and long-reaching program of education and training, which includes establishment of the Transportation Center at Fort Eustis, Virginia. Here it will provide comprehensive training for enlisted men in more than 90 different skills, ranging from Diesel mechanic to marine engineer, from boatswain to locomotive engineer, from electric locomotive repairman to marine diver, and from armorer to amphibian truck driver. In addition, Fort Eustis, which will have complete facilities for the thorough training of all TC personnel, will offer a course for camp, post and station transportation officers.

The education and training program for regular officers envisions within their first year of service, a three-month basic course at Fort Benning, Ga., and a basic branch course of five months at Fort Eustis. An associate branch course of three months also will be offered at Eustis for graduates of Officer Candidate School, Reserve and National Guard officers, officers from other services and foreign nationals. There will be a Regular Advanced Technical Course of 10 months for officers with from three to 10 years service, with an associate course of three months for Reserve, National Guard and Transportation officers, and for officers from other services. The over-all program continues for eligible officers through the Command and General Staff School, the Armed Forces College, the Industrial College and the National War College. A transportation course also is to be offered at the Air College. At this writing, eight leading American colleges and universities have agreed to take eligible officers for graduate and/or post-graduate work in transportation subjects.

The Corps' ROTC program contemplates the activation of from 30 to 35 units of 250 men each. Of these, perhaps seven will be activated this fall. Under War Department policies presently in vogue, the ROTC units would study the transportation course, of 160 hours per year, in their junior and senior years.

Nearing completion in the educational and training program are arrangements for extension-course instruction to Transportation Corps Reserve personnel. One out of every two officers in the A.U.S. who served with the Transportation Corps in World War II and who is now being relieved from active duty, is applying for a commission in the newly organized Transportation Corps Reserve. A surprisingly large number of these officers already are displaying eagerness to enroll in the proposed extension-course instruction.

The Transportation Corps has accepted the challenges to its ingenuity and determination implicit in its peacetime mission and responsibilities as eagerly as it accepted those imposed by war. It faces them with the same fresh vigor and vitality that carried it over many an "insurmountable" obstacle placed in its path by desperate and deadly enemy nations; with the same flaming faith in its abilities that made its troops certain during the war that if called upon to do so they could move mountains. It is determined that, military-wise, its superiority shall be unquestioned, and that its developments and progress shall be devoted to the common peacetime interests of the nation rather than exclusively to preparedness for war.

The Chief of Transportation is a technical staff officer of the War Department and commands the Transportation Corps. In these capacities he:

1. Renders technical and administrative advice and recommendations to the Secretary of War, Chief of Staff and the War Department General and Special Staffs.

2. Prepares plans, estimates, and orders affecting transportation matters or the Transportation Corps, in order to relieve the War Department General and Special Staffs of such routine duties.

3. Coördinates with the War Department General and Special Staffs with regard to their operational, administrative and technical plans and activities.

4. Exercises such Army-wide technical supervision of transportation activities and inspections in connection therewith as the Chief of Staff may prescribe.

5. Commands all troops and activities or services assigned to his command by the War Department and exercises the usual functions of command over such troops and activities and services.

6. Prepares plans for the transportation requirements of the War Department and advices the Director, Services, Supply and Procurement, WDSS, with respect to transportation problems.

7. Represents the War Department in obtaining allocations of shipping from the War Shipping Administration and from the Combined Shipping Adjustment Board, or such other similar organizations as may exist.

8. Directs the application of shipping available to the War Department to meet the requirements of the Army and the United States Military missions aboard.

9. Prepares and disseminates information regarding the status of troop and freight movements, location of ships, ship movements, and ship and cargo losses pertaining to the Army.

10. Maintains liaison for the War Department and negotiates with surface commercial carriers, including the railway industry, the commercial motor transportation industry, the commercial shipping industry, including inland waterways and the Great Lakes shipping industries, the Office of Defense Transportation, and other U. S. Government agencies on all matters of surface transportation, including rates, classifications, agreements, and conditions of handling all movements of War Department personnel, freight and cargo.

11. Prepares the budgetary requirements for the movement of War Department freight and exercises staff supervision over the expenditure of these funds to insure the most efficient and economical use thereof.

12. Establishes the policies and procedures for the operation of the Army ports of embarkation to include those pertaining to direction and coördination of shipping procedures and warehousing and storage functions.

13. Exercises staff supervision and control over the assignment and maintenance of all War Department floating equipment, except stream-crossing equipment and that required for river, harbor, and fortification work under the Chief of Engineers, and rescue boats under the control of the Commanding General, Army Air Forces.

14. Designs, procures, and purchases (including inspection) floating equipment for the War Department, except: stream-crossing equipment, and vessels and floating equipment required for river, harbor, and fortification work under the Chief of Engineers, and the design of rescue boats of the Army Air Forces.

15. Designs, procures, and purchases rail equipment for the War Department.

16. Procures specialized pier and ship cargo-handling equipment for the Transportation Corps.

17. Exercises technical staff supervision over the operation of all utility railroads and over the allocation, maintenance, repair, and economical use of all railroad equipment of the War Department.

18. Exercises staff coördination and control over movements of troops and other War Department passengers and all War Department-owned and controlled freight and cargo within the Zone of the Interior by commercial motor, rail, water, and air (non-contractual) and to and from overseas theaters by water and by civil air (non-contractual).

19. Issues releases under a block system to regulate the movement to ports of Army cargo for export.

20. Routes all War Department freight of one or more cars and/or the equivalent of one carload or more (as usually loaded) if moved by truck, and all inland movements of troops in groups of fifteen (15) or more.

21. Computes freight rates for procurement officers in the field.

22. Operates the War Department fleet of railroad tank cars.

23. Exercises staff control over the operation of Army Reservation Bureaus.

24. Makes basic determinations of requirements for administrative and L of C (Line of Communication) cargo and personnel vehicles, Transportation Corps truck units and related equipment to meet the needs of the War Department.

25. Exercises staff control over the allocation and utilization of administrative vehicles (as defined in WD Circular 139, 1945) and first and second echelon maintenance thereof, except for the Army Air Forces.

26. Provides the War Department with traffic and transportation engineering service (except air), including the determination of foreign and domestic transportation capabilities and requirements.

27. Formulates plans, policies, and technical methods governing the training of personnel engaged in transportation activities, except air, and except those assigned by the War Department to other commands for supervision.

28. Commands and operates ports of embarkation, the Transportation Corps Board, Transportation Corps Supply Depot, Transportation Corps Railroad Repair Shops, and the Transportation Training Center.

Transportation Corps trucks are taking supplies from freight cars operated by TC Military Railway Service units in a town near Frankfurt, Germany.

TANK AND ANTITANK*

by Brigadier R. M. P. Carver

"In the battle of El Alamein, in 1942, on which Rommel pinned his hopes of reaching Alexandria, we had available approximately 200 Grants, 100 Crusaders, 100 Stuarts and 100 Valentines. . . . Rommel employed about 300 German tanks, almost all Mark IIIs and IVs, mostly the latter. The latest improvement on his side was the Mark IV Special, equipped with the long 75mm (Kwk-40), designed as an antitank gun and superior to the 75mm in the Grant, and the 6-pounder. . . . This time there was no surprise; he had little space to maneuver and we were well ensconced in an excellent battle position. He ran his head right into it and our 75mms and 6-pounders took heavy toll, though we realized that the Mark IV Special was a tank to be reckoned with."

THE present seems to be an appropriate time at which to review the development of tanks, Allied and Axis, during the war and of the antitank weapons produced by either side. It is an interesting story, the truth of which has been distorted by controversy and ignorance. One major cause of misunderstanding has been the claim to have produced a weapon which to the soldier is useless until not only has he received it in the field in sufficient numbers to replace its predecessor, but has also been trained in its use, and has with it the accessories and behind it the spares necessary to maintain it. It was, I think, Mr. Duff Cooper, then Secretary of State for War, who in 1935 said that we had the best antitank gun in the world. He was alluding to the two-pounder. If there were any fit to fire at that time, they were not outside the experimental ranges. In the Middle East, then the threatened theater of war, they were not in service until the end of 1940. Misleading statements of that kind are the cause of controversy which has confused the issue on countless occasions.

FRANCE, 1940. In 1940 when Germany attacked the Low Countries, we had the following tanks in service:

Matilda, Mark I. A three-man I tank mounting a 2-pounder and co-axial .303 Vickers machine gun. Well armored for its day with 75mm but very slow, underpowered, unreliable and with a very short range. Not more than about 60 of these. No spares.

Cruiser, A.9. Forerunner of the Valentine: originally designed by the late Sir John Carden before his death in 1936. Crew of six. Armor about 14mm. One 2-pounder gun and three .303 Vickers machine guns. Range about 100 miles. Speed 20-25 m.p.h. Unreliable on account of track defects. No spares and often not the full complement of weapons. Nevertheless the best tank in the service of either the British or the French. About 100 of these.

Light Tank, Mark VI, VI-B or VI-C. Crew of three. Armament one .5-inch and one .303-inch Vickers machine gun. Armor 14mm. Very poor cross-country capacity. 35-40 m.p.h. on roads. Reliable, having been in service since 1935. Range about 100 miles. Purely a

*Journal, Royal United Service Institution.

reconnaissance vehicle, but provided in fact the equipment of the vast majority of tank units.

In the same campaign the Germans used the following types of tank:

Pz-kw, Mark I. A light tank inferior to our own in armament, having only two 7.92mm machine guns. Armor 14mm, equal to our own. Cross-country capacity slightly better. Crew of three.

Pz-kw, Mark II. An improved light tank, carrying one 20mm and one 7.92mm machine gun. Armor 15mm. Better cross-country capacity. Still really only a reconnaissance vehicle. Crew of three.

Pz-kw, Mark III. Cruiser-type tank. Originally carried one 37mm gun, equivalent to our 2-pounder and two machine guns. In the spring of 1941 it certainly had a 50mm gun. I do not know whether in 1940 any were equipped with 50mm guns. Armor 30mm. Crew of four. Good cross-country capacity and reliable.

As far as quality went, therefore, we would appear to have been pretty well on a level with the Germans, though our Cruiser was thinner than their Mark III. In quantity we were hopelessly at a disadvantage. Light tanks were the only ones available in any quantity. The Matildas were handicapped by their reliance on transporters for any major move. The only transporters available were railway flats, which were immobilized by the German Air Force. Wherever they fought German tanks they were successful, until overcome by weight of numbers and outmaneuvered as a result of their slow speed, short range and unreliability.

As far as weapons to deal with German tanks were concerned, quantity and inferior armor-piercing ammunition were the main disadvantages. The 2-pounder, whether in the tank or on a ground mounting, would knock out the German Mark I or Mark II at ranges up to 1,000 yards, and the Mark III up to 500 yards, if not slightly more. The Boyes antitank rifle and the Vickers .5-inch machine gun would penetrate the Mark I or Mark II at a range of about 400 yards, but were useless against the Mark III. The German 37mm antitank gun was equivalent to our 2-pounder and could knock out the Cruiser at about 500 yards, the Light Tank at 1,000, but made no impression on the Matilda. The 50mm antitank gun would knock out the Cruiser at 2,000 and the Matilda at about 800 yards.

Generally speaking, therefore, in this campaign it was quantity rather than quality in both tanks and antitank guns which was our chief disadvantage, though in the 50mm antitank gun the Germans were a considerable step ahead. I am not certain that they did in fact have them in this campaign; if they did, it was not in very great numbers, the 37mm being still their standard tank and antitank gun. In armor the Mark III was twice as thick as the A-9, but less than half as thick as the Matilda.

LIBYA, 1940-1941. At the beginning of the campaign against Italy in June, 1940, we had in Egypt approximately the following numbers and types of tank:

Cruisers, A-9 and A-10. About 60. Many of these, however, were without their 2-pounder and at least one machine gun. Much other necessary equipment, such as sighting telescopes and wireless sets, was also "to follow." There was a complete lack of spares. They were not subject in the desert to the track trouble experienced in France and were generally fairly reliable, after original cooling and air-cleaning troubles had been solved. The A-10 was substantially the same as the A-9 with two instead of three machine guns, and armor of 30mm instead of 14mm.

Lights, Mark VI, VI-B or VI-C. About 200, of which not more than 160 were in the field. Reliable apart from track trouble, which depended for its solution on a vast reserve of locally-made track pins.

The only Italian tanks up to February, 1941, were the Mark XI, a poorly armored unreliable Cruiser mounting a 37mm gun, of which there were very few, and the C.V-3 which could hardly be called a tank at all, a miniature machine-gun carrier which was little more than a death trap. As far as both quantity and quality went, therefore, we were definitely superior. For antitank guns we had two batteries of 37mm Bofors; their chief disadvantage lay in the fact that the ammunition for them was made in Poland and, therefore, once we had fired off what we had, the guns were useless. There were also some 2-pounders in the support company of the 1st Royal Northumberland Fusiliers at Mersa Matruh. In reserve were the old prewar medium tanks of 6th Royal Tanks, some dug in in the defenses of Matruh and some manned by the Egyptian Frontier Force in Siwa!

In October, 1940, the scale was turned even further in our favor by the arrival of the 7th Royal Tanks with some 50 Matilda Mark IIs, a great improvement on the Mark I, though with the same gun and armor; the 2d Royal tanks with 50 to 60 Cruiser A-13s and the 3d Hussars with 60 Light Tanks. The A-13 was the first Cruiser with Christie-type suspension, the pilot models of which had been made by Nuffields in 1936. In speed it was a great improvement on the A-9 and A-10, but had only 14mm armor and the same armament.

At the start of the offensive on December 8, 1940, we had in the field the following tanks:

Matilda Mark II, 50; Cruisers A-9, A-10 and A-13, about 170; Lights, about 160.

The Italians never produced more than about 100 M-11s, and always in such scattered groups that they were never a problem at all. For antitank guns we had more 2-pounders, which had replaced the 37mm.

The Matilda was "Queen" of the battlefield. The only things which could stop it were a mine or a direct hit by a field gun at short range. The real problem of the campaign was maintenance. By the time we reached Tobruk, tank strength had fallen to 16 Matildas, 50 Cruisers and 50 Lights. Only a small proportion of the losses were battle casualties. For the final battle of Beda

Fomm on February 8, 1941, the enemy produced about 40 new M-13s, a much improved Diesel-engined Cruiser with a 37mm gun. As, however, he only had scratch crews, who had snatched the tanks straight from the dockside in Benghazi, and as they were Italians, they proved little trouble to us. After the battle of Beda Fomm it was found that only 12 Cruisers and 40 Light Tanks fit for a farther 100 miles could be produced. By that time the 2d Armored Division had arrived, bringing, apart from what went to Greece, some 60 A-13 Cruisers and 60 Lights, the latter being kept at the base for reinforcements.

When Rommel attacked from Agheila in April, 1941, with his 5th Light Panzer Division, made up of Mark IIs and Mark IIIs, he was faced by the 3d Hussars with about 40 Lights and the 6th Royal Tanks with about 40 Italian M-13s. The 5th Royal Tanks with about 50 Cruisers, which had not been new when they left England, were in GHQ reserve at Tobruk. They were ordered up in a great hurry, too late. Many broke down and more ran out of petrol, with the result that they hardly affected the battle at all. Meanwhile mixed Light and Cruiser tanks and about 15 Matildas were rushed up to Tobruk, where they became part of the encircle garrison.

GREECE AND CRETE, 1940. The 1st Armored Brigade which went to Greece had some 60 Cruisers (3d Royal Tanks) and the same number of Lights (4th Hussars). In addition, the Divisional Cavalry regiments of the 2d New Zealand Division and the 6th Australian Division had a number of light tanks. Our Cruisers were mostly A-9 and A-10, which suffered very badly from the track trouble they had experienced in France, but not in the desert. For antitank guns we had 2-pounders, but not in profusion. The Germans produced many Mark IIs and a higher proportion of Mark IIIs, all now with the 50mm gun. They may have produced some Mark IVs: I am not certain. If they did, there were not many. The Mark III with the 50mm was definitely superior to anything we had, and we were hopelessly outnumbered. The few Cruisers we had were kept moving from one threatened place to another, and mechanical breakdowns were responsible for the majority of losses, becoming total losses as the withdrawal began.

To Crete went four Matildas, which were landed at the opposite end of the island to which they were most needed. Before the eastern Mediterranean route was closed, a mixed party of Matildas and Light tanks, amounting to about 30 in all, were sent to Malta. Known as "Malta Tanks," they were chiefly used for clearing wrecked aircraft off the aerodrome runways.

LIBYA: JUNE, 1941. One of the most significant battles of the war, as far as tank and antitank development was concerned, was fought on the Egyptian frontier in June, 1941. It was called "Battleaxe" and was a full-scale attempt to relieve Tobruk. It ended in complete and utter failure. As a result, hardly anyone outside the Middle East was allowed to know about it, which was a pity as there was much to be learned from it. For the first time against the Germans we had a full-scale tank versus tank battle, in which we were superior in numbers. The German tanks were almost all Mark III equipped with 50mms. We had about 100 Matildas and about 150 Cruisers. The 50mm was much superior to our best armament, the 2-pounder. The armor of the Mark III was about equivalent to that of the A-10, but thicker than that of the A-13. The armor of the Matilda was double the thickness of the German.

The main cause of our defeat was the German use of the 88mm antiaircraft gun as an antitank gun. The slow, unreliable Matildas were slaughtered by them. The Cruisers were outgunned by the Mark IIIs and also blown to pieces by the 88s. In addition, the Mark III with its 50mm could knock out our 2-pounder antitank guns, impossible to conceal in the desert, from ranges at which it was itself invulnerable to them. Our only effective antitank weapons were now the 25-pounders of the Royal Horse Artillery diverted from their field rôle.

The lessons to be learned from this battle were:

1. That the only limit to the range at which the 88 could knock out our tanks was visibility—up to 3,000 yards. Therefore only artillery could deal with them. Artillery support of tanks was therefore necessary at all times.

2. Our tanks, with the exception of the Matilda, could not fight a tank versus tank battle on equal terms with the German Mark III.

3. The Matilda was too slow and unreliable to be used as a cruiser tank in the desert.

4. The 25-pounder was the only effective antitank weapon we had.

The result, therefore, was an immediate need for an increase in supporting artillery, partly for the support of tanks, partly for use as antitank weapons. This need was not met.

SYRIA: JULY, 1941. No tanks took part in the Syrian campaign other than Light tanks of the 6th Australian Divisional Cavalry. The French produced some Renault tanks equipped with 37mm, which could be dealt with adequately by 2-pounders. Their presence came as a surprise and they caused considerable casualties when they first appeared, the British troops opposing them having only antitank rifles—those useless weapons, which were for so long an unnecessary burden to the PBI.

LIBYA: WINTER, 1941-1942. At the opening of the "Crusader" operation in November, 1941, we had approximately the following numbers and types of tanks actually in the field:

Matildas, Mark II, 100; Valentines, 50; Cruisers, A-10 and A-13, 150; Crusaders, A-15, 170; General Stuarts (American), 170; total, about 650.

Inside Tobruk we had the 1st Royal Tanks with a mixed collection of 50-odd tanks, varying in type from Matilda to Mark VI Light, and the 4th Royal Tanks with 50 Matildas, brought in by landing craft during the preceding month.

This operation, therefore, saw the arrival of three new types, the Valentine, the Crusader and the Stuart, the Stuart being the first American tank with which we were equipped. Details of these tanks were as follows:

Valentine. Development from the A-10, but with much increased armor. Armament still 2-pounder and two Besa 7.92mm machine guns. Armor 60-65mm, about double the thickness of the A-10. The engine being the same, the Valentine was considerably slower. It was fortunately very reliable. Crew of four.

Crusader. Development from the A-13. Armament still 2-pounder and two Besa 7.92mm machine guns. Armor 40mm. Fast, well-sprung, but hopelessly unreliable, involving constant attention by drivers and fitters. Crew of five.

Stuart. A small light tank, with a badly designed fighting chamber. Armament 37mm, almost exactly equivalent to the 2-pounder, and two .3-in. Browning machine guns. Armor 40-45mm. Its great advantage was its extreme reliablity. Its great disadvantage was its very inadequate petrol tank capacity, giving an endurance of only 40 miles. Crew of four, very cramped. Although its only advantage over the Crusader was reliability, it was much preferred by many

For antitank guns we had 2-pounders in rather greater numbers than before. The only better antitank gun was in the 1st South African Division. Their antitank batteries each had a troop of 18-pounders, old field guns converted.

Rommel had three armored divisions, two German—the 15th and 21st (the old 5th Light)—and one Italian, the Ariete. Each had about 150 tanks. The majority of the German were Mark III, about equal in armor to the Crusader and Stuart, but better armed with 50mm. A new arrival was the Mark IV. This had slightly thicker armor than the Mark III, but not as thick as the Valentine. It was equipped with a short-barrelled low velocity 75mm, designed as a close support HE weapon, but also very effective as an armor-piercing weapon. These made up less than a quarter of the total. There were also a small number of Mark II light tanks. The Italian were all M-13s, equivalent to the Stuart, but with weaker armor. For antitank guns the Germans were liberally equipped with 50mms and 88mms, the Italians with 37mms and 47mms—neither very effective guns.

We therefore outnumbered the enemy by about three to two in tanks. The Germans had a slight superiority in armor and a definite superiority in tank guns and antitank guns. The proportion of supporting artillery to tanks was still inadequate on our side. Only one armored brigade—the 4th Armored Brigade, equipped with Stuarts—had its own regiment of Royal Horse Artillery.

From the beginning of the series of tank battles which dominated the "Crusader" operation, it was obvious that we were at a great disadvantage, our tanks being vulnerable to the enemy's tank and antitank guns at ranges at which we could not penetrate their tanks. At the end of the first week the three armored brigades of the 7th Armored Division were reduced from a strength of about 450 to a total of 50 tanks. By remarkable efforts of recovery, repair and reorganization, this number was quickly reinforced; but after the relief of Tobruk there were only enough tanks and crews to man one brigade. In spite of our inferiority in the quality of tanks and in quality and proportion of antitank guns to others arms, Tobruk was relieved, and Rommel chased back to Agheila. He was reduced to a strength of 8 tanks at one time before reinforcements reached him at Benghazi. It was a remarkable feat, achieved by courage, determination and skill, helped not a little by Rommel's mad and ineffective dash to the frontier at the crucial period of the battle. The outstanding lessons of the operation were the need for a better gun in our tanks and the need for ample and intimate artillery support for tanks.

LIBYA: SUMMER OF 1942. Our tank strength in the desert in May, 1942, when Rommel attacked, was roughly as follows:

Matilda, Mark II, 150; Valentines, 150; Crusaders, 200; Stuarts, 100; Grants, 150; total, 750.

In addition there was a brigade in GHQ reserve which was brought up in the middle of the battle with a further 50 Grants and 100 Stuarts. The General Grant was an American tank, originally designed as a heavy tank for the close support of infantry. For armor it had 75mm on the turret and 45-50mm on the hull. Its armament consisted of one 37mm in the turret and one 75mm in a sponson in the hull with limited traverse, and two .3-inch Browning machine guns. Its advantages over previous tanks were its slightly thicker armor, its 75mm gun, its reliability and the ample room for the crew. Its disadvantages were the fact that its main armament was low down in the tank, with the result that almost all the tank had to be exposed before the 75mm could be fired, and that it only had limited traverse; in addition it was very bulky, making a big target, and had an endurance of only about 70 miles. Of the three brigades equipped with a proportion of these tanks, two had only received them just before the battle started. Their gunnery mechanism was quite different to any we had had before and entailed considerable training.

For antitank guns a few of the new 6-pounders had arrived just before the battle and had been issued to the armored divisions, but many gunners had not had an opportunity of firing them.

The enemy had about 300 German and 150 Italian tanks. The German were Mark III and Mark IV, with a

greater proportion than previously of the latter. Both had reinforced their armor, but the armament remained the same, though in many cases the 50mm of the Mark IIIs was of an improved type with a higher muzzle velocity. The Grant was the equal of the Mark IV, though a more difficult tank to fight, and the superior of the Mark III. The Italian tanks were still M-13s. In antitank guns we now had a few 6-pounders, which were most effective against all enemy tanks in spite of their very bad sights; but the Germans now had 88mms and the improved 50mm on a much more lavish scale. At one period in the battle round Knightsbridge we did use heavy antiaircraft guns as antitank guns with great effect. The advent of the Grant and the 6-pounder was extremely valuable, but the great majority of tank and antitank guns were still 2-pounders and at an even greater disadvantage *vis à vis* the Germans than in the winter. For the first three weeks of the battle the enemy's losses in tanks were generally in the same proportion to his total strength as our own. On June 16, however, we lost almost all our remaining strength of Grants to his antitank guns, while he lost practically no tanks; from then on the balance of superiority in tanks was heavily loaded in his favor.

In the fighting in July, which ended in the stabilization of the line south of El Alamein, we had a definite superiority in numbers of tanks, a complete new brigade of Valentines having arrived, but only a small proportion were Grants. We were still relying mainly on Matildas, Valentines, Crusaders and Stuarts. More 6-pounders were available, in spite of the heavy losses round Tobruk, but the 2-pounder was still predominant.

EL ALAMEIN. In the battle on August 31, 1942, on which Rommel pinned his hopes of reaching Alexandria, we had available approximately 200 Grants, 100 Crusaders, 100 Stuarts and 100 Valentines. A few of the Crusaders were equipped with 6-pounders, otherwise there was no new type of tank on our side. Six-pounder antitank guns were by now fairly plentiful and had almost entirely superseded the 2-pounder. A new high velocity shell had been produced for the 2-pounder, but it was still hopelessly inadequate as an antitank gun. Rommel employed about 300 German tanks, almost all Mark III and Mark IV, mostly the latter. The latest improvement on his side was the Mark IV Special, equipped with the long 75mm (Kwk-40), designed as an antitank gun and superior to the 75mm in the Grant and the 6-pounder. All the Mark IIIs now had the long improved 50mm. Both were carrying extra armor and were considerably heavier than the original design, a fact which caused them increasing mechanical trouble. This time there was no surprise; he had little space to maneuver and we were well ensconced in an excellent battle position. He ran his head right into it and our 75mms and 6-pounders took heavy toll, though we realized that the Mark IV Special was a tank to be reckoned with.

The Battle of Alamein itself was a great milestone in tank development from our point of view, as it saw the advent of the Sherman tank. This was a great improvement on anything that had gone before. Its armor was 65-75mm. Its gun was a 75mm of what was then considered high muzzle velocity, mounted in the turret. Firing armor-piercing shell, it was superior to the Mark IV Special. The guns of each were just about equal in performance, but the Sherman was better armored. Firing HE shell it could compete with the 88mm antitank gun. It was reliable, roomy and excellently designed for fighting.

By now the 6-pounder antitank gun had almost entirely superseded the 2-pounder, and the proportion of antitank guns to other arms was liberal. In addition, a small proportion of Crusaders were equipped with 6-pounders. The Matilda had at last disappeared except for 32 mine-clearing flail tanks, the first ever to be used. Our approximate tank strength at the beginning of the Battle of Alamein was 400 Shermans, 130 Grants, 200 Crusaders, 120 Stuarts and 200 Valentines. Of these 1,050 tanks, 538 carried 75mm guns and 650 were American. The Germans had about 400 tanks and, in addition, a number of self-propelled antitank guns. About half of these carried the long 75mm Kwk-40, the rest 50mm. For antitank guns they had a large number of 88mms and 50mms. The 75mm towed antitank gun had not yet appeared. With the Sherman we had at last not only a vast superiority in numbers, but also a superiority in armor and armament. The 88mm remained the greatest menace; it was defeated by artillery support and by HE fire from Grants and Shermans. There is little doubt that the Sherman was one, probably the main, deciding factor in our victory.

TUNISIA. The British First Army introduced the Churchill to battle for the first time, except for four tanks tried out at Alamein. With armor of 87-100mm and a 6-pounder gun it was a considerable improvement on the Valentine, which it succeeded as the British tank designed primarily for the support of infantry. It was, however, unreliable at that time. Its armor was no real protection against the 88 and it was vulnerable at 500 yards to the new 75mm antitank gun, which the Germans first produced in Africa in January, 1943. Its 6-pounder gun was able to compete with the Mark IV Special, but was useless as an HE weapon.

When it first landed, the British 6th Armored Division was equipped with Crusaders, which it thankfully exchanged for Shermans in February.

At the Battle of the Mareth Line in March, 1943, the Eighth Army had three armored brigades equipped with about two-thirds Grants and Shermans, and one-third Stuarts and Crusaders, an increased proportion of the latter carrying 6-pounders. In addition there was a brigade of Valentines, a small proportion of which were now also equipped with the 6-pounder. For the Battle of Medenine, which preceded it, we had a few of the

new 17-pounder antitank guns, but they did not come into action. In his disastrous attack on this occasion Rommel used three Panzer divisions, mostly equipped with Mark IV Specials. By now he also had a number of self-propelled guns, mostly 75mm, on a variety of chassis—Czech, French and German. He was defeated mostly by 6-pounder antitank gun fire and concentrated artillery fire, our own tanks hardly being engaged at all. Where they were engaged, the 75mms of the Shermans and the 6-pounders of the Crusaders did great damage. The Americans with the First Army were equipped with Shermans and Stuarts.

It was not until after crossing the Wadi Akarit in April that the Eighth Army met its first Tiger. This formidable tank had 82-110mm of armor and carried an 88mm gun. It was, therefore, more heavily armored than the Churchill, which appeared in the field about the same time, and very much better armed. The only antitank gun we had which could deal with it was the 17-pounder, of which there were very few at that time. Luckily there were also few Tigers. They were not, we believed, reliable. By the time we in the Eighth Army met them, the Germans had already lost the campaign except for the final stand round Tunis, and they were chary of risking the loss of precious Tigers. They therefore inclined to withdraw when heavily shelled and did not prove the nuisance they might and could have been. At the end of the campaign in Tunisia we had an overwhelming superiority in numbers of tanks, an increasing number of which were Shermans, which had proved the superiors of all German tanks we had met except the Tiger. We had evolved tactics, employing the intimate coöperation of HE fire from artillery and tanks, directly or indirectly fired, which defeated the normal ground antitank gun, 50, 75 or 88mm, in open country. The PIAT in the British Army and the Bazooka with the Americans had begun to replace the obsolete antitank rifle as the light short-range personal antitank weapon of the infantry, both firing hollow-charge HE projectiles. The 17-pounder had just begun to appear and was for a short time the best antitank gun on either side in the field. At any rate it had proved capable of dealing with the Tiger at over 1,000 yards.

SICILY AND ITALY, 1943. The end of the North African campaign saw the end of the Grant, the Crusader and the Valentine. The Stuart remained on the scene, in small numbers in the British Army, in greater quantity in the American, purely as a reconnaissance vehicle. It was definitely now a light tank. All the British, Canadian and American tank units which took part in the campaign in Sicily and in Italy up to the end of 1943 were equipped with Shermans throughout. The Churchills remained in North Africa and did not come over to Italy until 1944. The Germans produced few tanks in Sicily and not many were seen in 1943 in Italy, except in the counterattacks at Salerno and on the River Sangro. The country and the fact that the Germans were permanently on the defensive gave an added importance to their antitank guns. The most notable changes were the great increase in self-propelled antitank guns of all calibers up to 105mm. Inconspicuous, mobile and armored all-round and overhead against shell fragments, they could not be defeated by the tactics of HE fire used in North Africa. In addition, the thick country and the introduction of flashless powder made it very difficult to locate guns when they fired. The ranges at which most tanks were knocked out were now about 100 yards instead of 1,500, which had been the average in Africa.

The other main advance in German antitank weapons was the first appearance of the 88mm designed purely as an antitank gun, no longer dual purpose antiaircraft and antitank. It was lower, more mobile, had an armored shield, improved sights and a considerably improved performance. The Germans also produced in larger numbers different types of light taper-bore antitank guns. These fired a small projectile which had a considerable power of penetration. On our side more 17-pounders were available and we had also a number of American self-propelled 76mm antitank guns, called by the Americans "Tank destroyers" or M-10s. These had a better armor-piercing performance than the 75mm in the Sherman, but not as good as the 17-pounder, and were not really effective against the Tiger except at very short ranges. The Germans did not produce their version of the Bazooka in Italy until 1944, although they had long used hollow-charge shells fired from field guns.

NORTHWEST EUROPE, 1944-1945. The main features in the development of tanks and antitank guns by the time that the invasion of Normandy took place were the following:

British

1. Introduction of 17-pounder in Sherman. (Ratio of one 17-pounder to three 75mm in fighting troops.)
2. Appearance of Cromwell, armed with 75mm.
3. Introduction of 75mm in Churchill (ratio initially one 75mm to two 6-pounders in fighting troops and subsequently two 75mm to one 6-pounder).
4. Introduction of flame-throwing Churchill (Crocodile).
5. Use of amphibious tanks (Shermans).
6. Increase of armor on Churchill.
7. Improvement of mine-clearing tanks and increase in numbers. Sherman Crab.
8. Disappearance of 2-pounder antitank gun. The 17-pounder now standard, with the 6-pounder replacing the 2-pounder in infantry battalions.
9. Increased number of self-propelled antitank guns. Conversion of proportion of M-10s from 76mm to 17-pounder.
10. Introduction of rocket-firing aircraft.

American

Nil, except that some Shermans were equipped with

76mm in place of 75mm and that the Stuart was relegated to reconnaissance only, though still used in larger numbers than in the British Army.

German

1. Appearance of Panther.
2. Increased proportion of Tigers and Panthers.
3. Vast increase in numbers of Bazooka-type weapons.
4. Increase in number, type and effectiveness of self-propelled antitank guns.

When the 21st Army Group was completely ashore at full strength its British, Canadian and Polish forces had approximately the following numbers of tanks in the field, excluding reserves outside units:

Sherman 17-pounders, 320; Sherman 75mm, 1,400; Cromwell, 390; Churchill 75mm, 50; Churchill 6-pounder, 400; Churchill Crocodile, 60; Sherman Crab, 120.

Of this total of about 2,740 tanks, two-thirds were American. All the self-propelled antitank guns were American, although about a third had British 17-pounder guns in them. Not counted in this total were about 150 AVREs (Armored Vehicles Royal Engineers), all Churchills. Equipping Shermans with 17-pounder guns was a British idea, the conversion being carried out in England. Only British, Canadian and Polish tank units were equipped with them—no American.

As the campaign proceeded, the total number of tanks in the field declined, as the size of the British armies dwindled also. The main changes were an increase in the proportion of 17-pounder to 75mm Shermans, the proportion doubling by the end of 1944; the conversion of all Churchills to 75mm and an increase in the number with thicker armor; an increase in the number of Crocodiles and the conversion of all self-propelled antitank guns to 17-pounder, including the appearance late in the year of a British self-propelled 17-pounder antitank gun on a Valentine chassis, replacing a proportion of towed 17-pounders. Later still, in the spring of 1944, one armored division, which had been equipped with Shermans, was re-equipped with British Comets. There were also important developments in armor-piercing ammunition. These, however, did not become effective until after the end of fighting in Normandy. The Cromwell had the same armament and approximately the same armor as the Sherman. It was smaller, faster and, unlike its prototype the Crusader, reliable. An attempt to produce a modified Cromwell, called a Challenger, with a 17-pounder in it, was initially not a success because the tank was mechanically unreliable. The unreliability was eventually overcome. The Comet, developed from the Cromwell, appeared first in the field after we had crossed the Rhine: it had improved armor and armament, as well as better cross-country capacity.

On the German side the outstanding success was the Panther. Its main armament was a long 75mm (Kwk-43) of performance equivalent to our 17-pounder. Although the sides of both turret and hull were considerably thinner than those of the Tiger, the front of the turret was 110mm and the front of the hull formed by two plates, the main glacis plate being of 80mm sloped at an angle of 55° from the vertical. This combination of thickness and angle made it immune from 17-pounder fire at over 800 yards. The Panther was lighter, more maneuverable and apparently more reliable than the Tiger. The final development in German tanks was the Royal Tiger. Very few of these were ever met, only one or two before Falaise. It carried the latest type of 88mm, with a performance considerably superior to the 17-pounder. The armor was a considerable improvement on the original Tiger, thicker and with sloping instead of vertical plates. Thicknesses and angle from vertical were: Turret front 180mm at 10°, turret sides 80mm at 20° Hull front: top plate 150mm at 50°, bottom plate 100mm at 50°. Hull sides and rear 80mm at 25°. It was a very formidable tank, but one which in view of its weight, petrol consumption and size must have presented to the German staff many problems in its movement.

In addition to Panthers and Tigers, the Germans had a large number and variety of self-propelled antitank guns, chief of which were the Jagdpanther and Jagdtiger. These carried the latest types of 75mm and 88mm guns, had very thick front plates and were armored overhead against shell splinters. They were less conspicuous than tanks, but had only a very limited traverse. For towed antitank guns, 88mms were plentiful, but the 75mm Kwk-40 provided the great majority. In the later stages of the campaign, particularly beyond the Rhine, the 50mm and even the 37mm reappeared in greater quantities, but in Normandy the 75mm and 88mm were the standard antitank guns.

The development which caused us greatest trouble and which forced a revolution in tank tactics was the introduction on a lavish scale of the Bazooka and its smaller equivalents, the Panzerfaust and Faustpatrone. These were all different forms of hollow-charge projectiles varying in range from 50 to 200 yards, cheaply and easily produced. Right up to the very end every detachment of German Infantry was liberally supplied with them; they were capable of knocking out all our tanks, even the heavier Churchills. They were especially effective in the thick *bocage* country of Normandy and in villages and woods.

On our side probably the most significant development as far as this campaign was concerned was the Crocodile flame-thrower, though without the 17-pounder Sherman we should not have got far. On the German side the Bazooka and its lesser brethren, and the Panther and its self-propelled antitank gun equivalents were the most notable. In addition we had the added advantage of the rocket-firing fighter, which was particularly effective against armored fighting vehicles on the move on approach marches or in withdrawal.

THE RUSSO-GERMA

by Captain Fe N

PARN

(Although the battles outlined in this story have been covered in thorough detail in previous issues of the JOURNAL, *we feel that this report gives such an over-all and comprehensive view of the Russo-German campaign that it warrants publication. The second installment will be carried in the next issue of the* JOURNAL.—EDITOR'S NOTE.)

DURING the six years of war in Europe the needs of security prevented the publication of many facts concerning the campaigns, but now that hostilities have ceased the true story of the major operations is rapidly being made known. In Britain and America, in addition to the official documents that are being placed before the public, commanders who held important positions are putting into print the details of the great actions which occurred under their control, and the errors as well as the successes are being disclosed. But from Russia comes little information. The Soviet government evidently intends to keep for its own use the war lessons learned by the Red Army.

Bearing this in mind—and bearing in mind also that Russia is the newest and now one of the two greatest military or land powers in the world and therefore a subject of great military interest, anyone wishing to study the late war in Russia, either for its general lessons or for their possible application to the future, must look far and wide and learn to apply the smallest details of scrappy information to the general principles which govern them.

Since the middle of the nineteenth century the Russian Army (Tzarist and Red) had few successes to weld into a tradition. In the 1914-17 war the "Russian hordes" found that strategy was of greater value than numbers, but the lesson was learned too late to be applied. The operations of the new Red Army (1918-21) against the White Russians and later against the Poles showed the same weaknesses as under the Tzar. In 1939-40, the war with Finland appeared to be equally badly conducted. Here, however, the would-be omniscient observers "missed the bus," for it was not through Soviet mismanagement that the Finns remained so long undefeated. Nor was the Finnish war (as some said later) "a great bluff." The Russians fought well, but the terrain and the Mannerheim defenses, the short front and the hard winter, made greater speed of advance impossible.

The Russian soldier is as good as any other, obedient if rather undisciplined, earnest if often illiterate.[1] His commanders are good, the staffs generally competent. Russian generals are inclined to independence of action and occasional unorthodoxy in method, but in so large a country every army commander must, after all, be his own commander in chief. In the field of tactics and strategy a certain weakness is, however, very noticeable.

The greatest Russian want, not alone in 1941, but all through the hardest war years, was good up-to-date equipment. Lack of equipment, especially of transport and signal equipment, made strategic operations slow and cumbersome, and the Russians had to make up for surprise by an overwhelming superiority in man power. In *"Our Armored Forces,"*[2] Lieut.-General Martel points out how the Russians never attempted an offensive unless they had a three- or four-to-one superiority. They were amazed at the intrepidity of the British in Libya, who dared to attack when they were actually weaker than the Germans and Italians opposing them.

The organization of the Red forces was, in the main, similar to that of other nations. But a rigid "war establishment" was something unknown to the Soviet commanders, and they were willing to fight with any combination of units. Each army commander developed his own organizational system within his own command.

The air forces were mainly divided into three types. The most important was Army Coöperation Command, whose units acted directly under army control. Next came Long-Range Bomber Command, and finally Defense Command. An Air Army was normally attached to each Army Group or Front. A Front comprised two to five armies. The air army was made up of air divisions, each of three or four air regiments. The air regiment contained two to four squadrons of 15 aircraft per squadron.

In addition to their bombers, fighters and reconnaissance aircraft, the Russians employed *Stormoviks*—heavily armored planes used for strafing ground troops from a low level. Many of these aircraft carried cannon

★*An Cosantoir*, The Irish Defense Journal.

[1]Despite Soviet statements to the contrary, the standard of illiteracy in the U.S.S.R. is still extremely high.

[2]Reviewed in the April issue of *An Cosantoir* by the author of this article.

AN BATTLES – 1941-45*

Fe N. Fitzgerald

ARNE

for attacking hostile tanks.

The armored unit was the Corps. An Armored Corps contained a tank brigade (about 180 tanks), three lorry-borne brigades, and the usual complement of auxiliary arms. It was therefore, the approximate equivalent of a German, U. S. or British Armored Division.

The tanks used were the T.34 cruiser tank for exploitation rôles, and the K.V.[3] tank (and in 1944 the Stalin tank) for infantry-supporting action. Captured German tanks, and vehicles supplied by the Allies (especially the British Churchills), made up a very great part of Russian armor.

If one disregards the initial gains made by the Germans in the Summer and Autumn of 1941, when the Red Army was still raw and inexperienced, one must recognize that the chief feature of the Russian forces was an ability for dogged defense in the face of overwhelming odds. The loss of Kiev was not to be repeated, and in 1942 Voronezh and Stalingrad held out heroically until the Soviet reserves were ready to launch their counteroffensive. In this way the German principle of victory through strategic break-through failed to be realized.

On their part, the Russians concentrated on the tactical employment of armored formations. Local break-throughs were exploited to turn German strongpoints. At Stalingrad, Orsha and Bobruisk, Russian tank columns (with accompanying mechanized infantry and artillery) forced their way through the defenses and then pushed the assault from the rear, while the less mobile elements exerted pressure on the front and contained the German troops. Tactical envelopment by mechanized forces became the main use of Russian armored units in attack.

In defense both sides employed tanks as improvised pillboxes and to augment the artillery. Tank formations were also widely used as operational reserves, to counter-attack wherever a hostile break-through appeared likely. According to Soviet sources, the German High Command issued several instructions dealing with the use of operational reserves. In particular, the High Command insisted that such reserves should not be split, but should be used together in the main counter-effort. This doctrine is self-evident, but it is not an easy one to put into practice. The enemy does not disclose his plan in the initial stages, and a number of factors may cause the commission of parts of the operational reserve on minor tasks. In January, 1944, General Tolbukhin was exerting strong pressure on Kirovograd and Krivoi Rog. The operational reserves of the Sixth German Army which held this area comprised two panzer divisions. Since a break-through at either of these points would threaten the entire German salient, a panzer division was dispatched to each of the locations menaced. When the attack on Nikopol, at the apex of the salient, took place in February, there were no general reserves available to meet it. With difficulty the panzer formation at Krivoi Rog was disengaged and sent toward Nikopol, but Tolbukhin's army had already defeated the German infantry and the reserve division was unable to stem the hostile advance.

In their counteroffensives, the Germans generally employed panzer units against the flanks of the enemy salients. The panzers were supported by infantry whose task it was to consolidate the gains won by the armor.

One of the major difficulties in the employment of large tank formations, particularly over long distances, is the control of sub-units. In the open steppes of southern Russia geometric formations were adopted by the Red Army and maneuvers were carried out with precision, even on the battlefield. This greatly simplified the commander's task, as he could observe progress and maintain direction without continually resorting to the radio—an instrument exceedingly scarce in the Soviet armies. Most frequently employed formations were the arrowhead, inverted arrowhead and echelon. Their use was similar to that of the equivalent infantry formations; arrowhead gave ample protection to the flanks, inverted arrowhead was used in enveloping maneuvers, and the echelon was employed when one flank only had to be covered.

It was learned that a single line of tanks, although it had great striking power and was often able to secure an initial penetration, lacked drive and was easily held. Tank attacks were therefore made in waves, the leading wave halting on the first objective and permitting the supporting waves to pass through under its covering fire.

[3]The T.34 cruiser tank weighed 27 tons and carried a 76mm gun and three M.G.s. The K.V. was 47 tons, with a 76mm gun and three M.G.s. The Stalin tank, used in the later battles, was an improved version of the K.V. type. Compares with German Tiger, 54 to 60 tons; U.S. General Sherman, 30 tons; British Churchill, 37 tons. Russian light tanks were the B.T. (13 tons) and the T.26 (9 tons); both were armed with a 45mm gun and two M.G.s.

If tank units led the attack, the infantry followed under the shelter of the vehicles, each wave being supported by a separate infantry force. An essential in all advances was a tank reserve, held in rear and ready to deploy as required.

The German units employed in Russia after 1941 were organized altogether differently from those used in the western and desert campaigns. In general, the divisional formation was only 60 per cent of what it was at home or in Libya. As far as possible the number of automatic weapons was kept at a high level, but the man power and the tanks were reduced considerably. The panzer divisions in the Soviet war contained only 250 to 300 tanks, instead of the normal complement of 350 to 400. In panzer corps and armies, the proportion of infantry was in an exceeding high ratio to the number of tanks.

Kiev Operation—September, 1941

The German invasion of Russia opened on June 22, 1941. By the beginning of August two German army groups stood northwest and southwest of Kiev. Von Bock's northern Group had taken Smolensk on August 7 and was now halting a moment in its "march on Moscow." This group contained Von Weich's Second Army and Guderian's Second Panzer Army. To the south Von Rundstedt's Group (Von Reichenau's Sixth Army and Von Kleist's Panzer Army) was near Katazin. Between Von Bock and Von Rundstedt lay the Pripet Marshes.

Early in August Von Rundstedt's armies converged on Uman where a strong Russian force was concentrating. The battle lasted until August 12, when Von Kleist's divisions broke through towards the Black Sea, and then swung northwards again towards Kirovograd on the Dnieper. Von Reichenau similarly advanced to the Dnieper near Belaya Tserkov and Cherkassy. Here both armies halted, for the advance to Kharkov—the next objective—could not be undertaken while the Kiev salient remained, and Von Rundstedt was unable to reduce it unaided.

The German plan was to execute a "double-double-envelopment" about Kiev in the manner of the Warsaw campaign of 1939. There was, however, this difference: in Poland the inner arms of the pincers had been by far the stronger, but in the Kiev operation it was the outer arms that would be the more powerful.

Von Rundstedt concentrated his two armies on the Dnieper, while Von Bock diverted Von Weich's force to the Mogilev area and Guderian's Panzer Army to Roslavl. Almost 300 miles separated the two army groups.

On September 1 the outer arms of the two army groups commenced their drives north and south. Von Kleist gained a bridgehead over the Dnieper at Kremenchug and moved towards Lochvitza. At the same time Von Reichenau's units crossed at Cherkassy and Kanev and marched westward toward Kiev.

But the decisive blow was to be struck by Von Bock from the north. When the decision was taken to encircle Kiev from both flanks, his army group had moved southward and by August 20 had taken Gomel, Guderian's tanks attacking the town from the rear while Von Weich assaulted frontally. By the end of August Guderian had forced the Desna at Novgorod Seversk and Von Weich had crossed at Chernigov. The bank of the Desna was Von Bock's line of departure, as the Dnieper Von Rundstedt's.

While Von Rundstedt drove northward across the Dnieper, Von Bock launched his offensive toward the south. By September 10 the break-through had been made in both sections and the panzers of Guderian and Von Kleist raced toward each other almost unopposed. Four days later the leading columns met at Lochvitza and Priluki. With the severing of Marshal Budenny's communications the main task of the panzers was completed. They now endeavored to prevent the escape of the Russian forces trapped in the Kiev region, while Von Weich and Von Reichenau closed in on the city with their infantry armies.

On September 10 Marshal Budenny started to evacuate the salient, but the movement came too late. On September 20 Kiev fell to the Germans. It is probable that 600,000 Russian troops were taken at Kiev, apart from the casualties in the fighting on the flanks of the salient. Only one of Budenny's five armies escaped the German encirclement.

Budenny can hardly have been surprised by the operation. The German preparations were carried out quite openly. But the speed of the panzer attack in the later stages of the battle undoubtedly achieved local surprise in many places. The Soviet Command showed a lack of decision in this operation, neither defending Kiev to the last nor yet ordering its evacuation while there was still time. The conquest of 25,000 square miles of territory in any Western European state would have spelt disaster; in the U.S.S.R. the loss was severe, but not final.

German Offensive at Stalingrad—1942

The most famous defense of World War II is that of Stalingrad. The Volga city itself was not the objective of the German offensive; it was by accident rather than by design that the Wehrmacht's forces were concentrated against it.

In 1942 the German General Staff abandoned the attempt to take Moscow by frontal assault. Instead they planned to seize the Caucasus with the threefold objective of cutting the Allied southern supply route to Russia, capturing the oil wells of Maikop and Baku, and turning the strategic flank of the defenses before Moscow and the west-Russian industrial centers. Had this plan been applied in 1941, instead of the dual offensives on Moscow and South Russia, the Soviet Union might have been defeated. As it was, by 1942 the Russian positions had been stabilized and the Russian

armies tried in battle. During the winter of 1941-42 they had even taken the offensive and had proved that under favorable circumstances they could drive back the Germans.

The German units in 1942 were greatly reduced in strength from the 1941 models. Furthermore, the High Command was obliged to depend to a considerable extent on auxiliary forces from Rumania, Hungary, Italy and Finland. There were 65 auxiliary divisions in Russia at this time, and it is a universal military truth that auxiliaries are of little value. The Russians soon learned to appreciate this fact when Marshal Zhukov's counteroffensive began.

By May 1942 the Germans had three army groups ready to open the attack in southern Russia. About Kursk stood Von Weich's Group—the Second Army and the Second Panzer Army, which had played so vital a part in the Kiev campaign during the previous year. Von Hoth commanded the Fourth Panzer Army and Sixth Army north of Kharkov. The First Panzer Army and Seventeenth Army, under Von Kleist, were between Kharkov and Stalino. Farther to the south, Manstein's forces were operating in the Crimea.

It will be observed that each army group comprised an infantry and a panzer army. The three groups, under the command of Von Bock, amounted to some 16 panzer divisions, six motorized divisions, 40 infantry divisions and between 15 and 20 Italian, Hungarian and Rumanian divisions.

On June 22 the initial "mopping up" of Russian forces along the proposed line of departure had been completed and the great offensive opened with the advance of the southern army group from its bridgehead over the Donetz at Kupiansk. On June 28 the second offensive blow was struck by Von Weich in the north; by July 1 the Second Panzer Army had broken through toward Voronezh. The next day Von Hoth's central group advanced eastward.

The front upon which Von Bock's offensive opened was little more than 250 miles long. It was not surprising, therefore, that the Russian defenses were rapidly pierced. On July 6 elements of the Second Panzer Army crossed the Don and entered Voronezh. This exploit savored strongly of a similar dash to Warsaw, three years earlier. As on the previous occasion, the tanks were insufficient to take the city, and when the Second (Infantry) Army arrived before Voronezh on July 10 the Russians had concentrated large forces—including armor—and a furious 10-day tank battle ensued.

The River Don forms a salient, pointing eastward, with one of its cornerstones at Voronezh, the other at the Black Sea, and its apex at Kalach, some 50 miles short of Stalingrad. The Germans intended to occupy this salient with two army groups while the third took the cornerstone, or haunch, Voronezh. The River Volga forms a second salient pointing eastward, this time with Stalingrad as the cornerstone on the north, the Black Sea again on the South, and Grozny the apex. One of the two remaining army groups would enter this salient and drive toward the apex, while the other took the cornerstone, Stalingrad. It was a simple geometric advance in echelon-from-the-right. It was, however, essential that the cornerstones, Voronezh and Stalingrad, should be captured, for if they were not, then the Russians would be left with pivots from which to launch a counteroffensive against the long German lines of communication. When, therefore, it became clear that Voronezh was not to be taken easily, Von Bock determined that the second cornerstone—Stalingrad—should not remain to menace the drive into the Caucasus.

On the southern wing of the attacking armies Von Kleist's tanks reached Millerovo on July 13. Manstein had now cleared the Crimean Peninsula and was free to join in the assault eastward. The Germans turned toward Rostov. But on July 27 the Russians abandoned the famous Don city, falling back before the converging attacks of Von Kleist and Manstein. By August 1 the First Panzer and Seventeenth Armies were south of the Don, heading for Elista and Maikop in the Caucasus region. Von Hoth's two armies were making for Stalingrad, via Kalach.

The Russian Supreme Command also appreciated the importance of Stalingrad (as they had the importance of Voronezh) and determined to hold it, even at the temporary sacrifice of the Caucasus. The proximity of the Don and Volga bends made strategic defense impossible, and the Soviet Command was forced to rely, therefore, on tactical defense near the city and even within the built-up area itself.

By August 15 the Germans had forced the Don at Kalach and 10 days later made another crossing at Kletskaya. To the southwest Manstein's troops from Rostov, reinforced with panzers from the now stabilized Voronezh front, neared Kotelnikovo. The Red Army threw in tank formations to oppose the Germans on the Askai River and large-scale tank battles resulted. By September 3 the Germans had the upper hand, although their tank losses reached a new height in this struggle. There were now some 750,000 men and 2,500 tanks closing in on Stalingrad.

At this stage the maneuver period was over. Sheer weight of numbers could alone bring the campaign to a close, for the strongly defended Volga line rendered an outflanking maneuver impossible.

To hold Stalingrad until a counteroffensive could be prepared, the Russians had left the northern Caucasus weakly held. Von Kleist's panzer and motorized units took Voroshilovsk on August 4 and on the next day reached the Kuban. On August 8 the Russians evacuated Maikop and by the 25th Von Kleist had reached Mozhdok on the Terek River. Here at last the Russians made a stand. A huge area had been conquered by the Germans—in the manner of Poland, France and Yugoslavia—with a comparatively small army composed mainly of panzer and motorized units. But unlike

those earlier campaigns, a final defense was put up, strong enough to delay if not to hold Von Kleist's forces.

In the mountain areas the German panzers found rapid advance and exploitation more difficult, and during September and October the struggle was slow and costly. Novorossisk was captured on September 10, but before Tuapse, as well as at Mozhdok, the offensive was held. On November 2 the Germans turned the Terek line, but on the 15th their tanks were routed near Ordzhonikidze.

Back on the Volga the close fighting continued. From September 15 to October 15 the German assaults were at their heaviest. Tanks, infantry and artillery were flung into the streets of the city, and at many points the attacking troops reached the Volga—only to be driven off again in fierce counter-charges. One surprising feature of the Stalingrad battle—which continued with less intensity on the part of the Germans until November 18—was the fact that no sizable reinforcements were ever sent to the commander of the Soviet garrison, General Chuykov. The Russian High Command was holding all its reserves for the great counteroffensive. Three armies were in the process of creation; two on the northern bank of the Don, northwest of Stalingrad, under Generals Vatutin and Rokossovsky, and the third, led by General Yeremenko, in the Ergeni Hills south of the besieged city.

Russian Offensive at Stalingrad—1942-43

By the middle of November the Fourth Panzer and Sixth Armies, now commanded by General Von Paulus, consisted of four panzer, three motorized and 15 infantry divisions. The bulk of this force was committed on the Krasnormeisk-Orlovka line, running through the factory districts of Stalingrad. Back across the 50-mile wide plain to the Don were German defenses, covering the supply bases and airfield that Von Paulus had constructed in order to relieve the long lines of communication and make him partially independent of the strategic depots west of the Donetz.

On Von Paulus' northern flank, reaching back along the River Don, were Rumanian and Italian formations. South of the Sixth Army, 13 Rumanian divisions, with some tanks and cavalry, held the railway line. The right flank of these Rumanian units was "in the air," only cavalry patrols maintaining contact with Von Kleist's armies in the Elista area. While the Stalingrad front was extremely strongly held, therefore, the northwestern sector was weak and the southern sector open. Farther back still, only minor forces of Von Weich's reduced army group opposed the Russian General Golikov at Voronezh. No sizable strategic reserve had been held out by the Germans.

It is hard to understand how the German High Command could have so blindly concentrated almost their entire striking force in the Stalingrad region or how the Wehrmacht commanders failed to observe the Russian preparations for a counteroffensive along the Don front. Von Paulus must have known that the Red Army defenders of Stalingrad did not represent the major portion of the enemy reserves. Yet when the Soviet counteroffensive opened on November 19, 1942 the Germans had made no preparations to meet it.

On November 19 Rokossovsky struck out across the Don at Serafimovich. By the next day a 20-mile gap had been made in the Rumanian defenses and Russian armor poured through. While one column made for Chernyshev another turned westward on Kletskaya and Kalach. The break-through was totally unexpected and the armored troops recrossed the Don at Kalach on November 21, taking Von Paulus' Sixth Army in the rear. The counteroffensive was only two days old.

On Rokossovsky's right General Vatutin also broke through the Don defenses. Together with part of Rokossovsky's armor, Vatutin defeated a Rumanian force north of Chernyshev and by the 21st he had crossed the Chir River and his armor was deploying over the steppes toward Millerovo and Likhaya. On the 22d three panzer divisions were met and defeated south of Chernyshev. A strategic break-through had been accomplished.

South of Stalingrad the Rumanian line lay along the railway. The troops were not, therefore, in a position to overlook General Yeremenko's approach from the Volga to the Ergeni Hills. On November 19, while Rokossovsky and Vatutin crossed the Don, Yeremenko descended the slopes to fall on the Rumanians. On the 20th he pierced their line at Abganerovo, near the junction of the Rumanian and German forces. By the 25th Yeremenko was approaching the Don, his right wing only 20 miles from Rokossovsky at Kalach. Von Paulus was almost surrounded.

Marshal Zhukov, the commander of the counteroffensive operations, did not make the error of exploiting too rapidly. The temptation to do so must have been great, for the undefended steppes presented an invitingly open region to the Russian tankmen. But the Russians had begun the attack with barely half the transport required for such a move, and rashness at this stage might have been disastrous. During the last days of November Zhukov consolidated what he had won.

It was obvious that to escape the ring which was closing about him, Von Paulus must fall back at once, preferably along the Stalingrad-Rostov railway line. His depots and airfields in the Don-Volga area must be abandoned, together with most of his heavy equipment. There was still some hope, if he could hold the Chir and the Askai river lines, of covering Von Kleist's withdrawal from the Caucasus.

A relief force was being assembled under Manstein about Kotelnikovo, but there were no reserves of sufficient strength to throw back the Russian attack. Russian moves on the central front about Orel and Bryansk were holding down the German units in those areas. Von Paulus could expect little assistance from outside his command. Yet he was forbidden to attempt with-

drawal. The reason for this may, indeed, have been partly a fear for Von Kleist, still many miles to the east of the Sixth Army. But Von Kleist's forces were neither as strong nor as well-equipped as those before Stalingrad, and their loss could not therefore be as serious. A second reason existed for holding the Sixth German Army within the grip of the closing Russian pincers. Hitler feared the result to German prestige of abandoning the city which had been so greatly publicized in the world's press.

On December 10 Manstein's relief force—some 150,000 men, and four divisions of panzers—set out northeastward from Kotelnikovo. On both sides of the Don, at Gremyachev and Nizhnechirsk, violent tank battles took place with Yeremenko's armored flank-guards on December 16. Had Von Paulus made a coördinated attack at the same time from the north of Yeremenko's corridor instead of an abortive effort to retake Kalach a week earlier, something might have been achieved. But by December 18th Manstein's assaults petered out and he was compelled to withdraw toward Rostov.

In the meantime on the Voronezh front, Golikov, supported by Vatutin's right wing, launched an offensive across the Don at Boguchar, cutting General Gariboldi's Eighth Italian Army in two. By December 24 this new advance, combined with the other blows they were receiving, obliged the Axis troops in this region to fall back towards Millerovo. General Malinovsky's Armored Corps were in action against Manstein in the Kotelnikovo area and on December 27 this German strongpoint fell to the Russian Commander.

By December 31 Von Paulus was surrounded, Manstein was in retreat, the whole Don salient was collapsing, and Von Kleist's Caucasian front was in imminent danger of being cut off from Rostov. Von Kleist had already been weakened by the transfer of some of his panzers to Manstein early in December. Now it was clear that he must fall back on Rostov. To do this his rearguards would have to be sacrificed.

By the end of December the Seventeenth and First Panzer Armies had abandoned the Terek line and General Maslennikov was in pursuit. After a sharp fight the right wing of the Russian Trans-Caucasian Army entered Elista on January 1, 1943. The Russian general had hoped to cut off Von Kleist by turning southward from Elista, but the German main body was already far to the west. On January 23 the Soviet troops re-entered Armavir, but Von Kleist had passed through the gap between Malinovsky's forces at Konstantinovsk and the Sea of Azov. Another large group withdrew to Novorossisk, where they held a considerable beachhead against repeated Russian attacks until the Summer of 1943.

At Stalingrad the New Year saw the liquidation of Von Paulus' Armies by Rokossovsky and Chuykov. After an ultimatum sent to the German commander on January 7, which the newly promoted Field Marshal rejected, the Russian attack commenced on the 10th. Some 80,000 men remained inside the Russian "steelring"—the rest (once 250,000) had been killed or captured. A fortnight later only one quarter of these were still fighting. On February 2 Field Marshal Von Paulus surrendered and the Sixth Army was finally eliminated.

Thus ended one of the most dramatic episodes of the entire war. It occurred shortly after the British victory at El Alamein and formed the second decisive battle of World War II. The campaign had peculiar features which are not easy to explain. The Germans, who started out so successfully, made glaring blunders of the most elementary kind. Did they really believe that the Red Army had no reserves, or that the reserves would not be in a position to counterattack as soon as they did?

In his article, *Strategic Objective*, which appeared in the Moscow bulletin *Voks* in 1945, Major-General Galaktionov quoted Marshal Stalin's speech of November 6, 1942: "What then, was the main objective of the German offensive? It was to outflank Moscow from the east; to cut it off from its Volga and Urals rear and then to strike at the city. The German advance southward, toward the oil districts, had an auxiliary purpose; not only, and not so much, to capture the oil districts as to divert our main reserves to the south and to weaken the Moscow front, and thereby facilitate the success of the blow at Moscow. . . . In short, the main objective of the German summer offensive was to surround Moscow and end the war this year."

The Russian leader—and with him Major-General Galaktionov—wishes to show that the Caucasian drive was merely a subsidiary effort on the part of the Germans. This is not unlikely, but the fact remains that to outflank Moscow by pushing east of Stalingrad necessitated the capture at the same time of the entire oil region up to the Caspian Sea. It is noteworthy also that neither the Marshal nor Galaktionov mentioned another German objective—the severing of the Allied supply route through Iran.

The Russian handling of the counteroffensive was far from perfect. After the first assault the energy of the Red forces appears to have died down. Not all the reserves were engaged in mopping up Von Paulus' Sixth Army, and ample time was given to seal the Rostov gap and prevent the extrication of Von Kleist's armies in the Caucasus, yet this was not done. However, the German losses were so great, and the blow to their prestige so powerful, that they never fully recovered in Russia.

(To be continued)

In the next issue of the JOURNAL *Captain Fitzgerald continues his examination of the major battles of the Russian war. He deals with the German offensive against Kursk in 1943, Tolbukhin's conquest of the southern steppes, the Russian assaults on Orsha and Bobruisk in 1944 (where they broke through the defenses of the "Panther Line"), Malinovsky's advance across the plains of Hungarian Transylvania, and finally the battle of Berlin.*

Japanese Preparations for Philippine Conquest*

by Captain T. W. Davison, U. S. Navy

THE following remarks reflect my personal observations of Japanese activities in the Philippine Islands during my tour of duty there from December, 1939, to May, 1942, two days before Corregidor fell. They in no way reflect any official opinion of any department of the United States Government.

For convenience, I shall group these Japanese preparations for conquest under two headings—Strategic Preparations, and Tactical Preparations. The former can be dismissed briefly, as they follow the German and Japanese pattern so common the world over.

Long-term, or strategic, preparation for conquest consisted in establishing a "Little Japan" colony in many key localities. One of the most publicized of these before the war was at Davao on the Island of Mindanao in the Southern Philippines. The inhabitants enjoyed local government to a large degree, wore native Japanese dress a considerable part of the time, had their man power mobilized into a closely organized, well-disciplined corps of "athletes," and conducted schools of their own where Japanese language was used and the Samurai code extolled.

Manila and other cities in the Philippines had similar Japanese colonies, the only outward difference being that the inmates followed city customs and were therefore less noticeable than their country cousins because of wider use of the conventional business suit, higher attendance at American-Philippine public schools, and greater use of English as the commercial language of the Far East.

There were two bluejackets in my crew who spoke Japanese, presumably having learned it from association with Japanese during some years of duty with the Yangtze River Patrol. One lived with a Japanese woman in Manila in the Japanese section of the city. The other had been married for some years to a Japanese. These men used to tell me "off the record" of some of the parties they attended in Nipponville. At suki-yaki dinners served over cozy little charcoal fires, their hosts would grow mellow and boastful, and drink toasts in warm saki to the Japanese equivalent of the old Prussian "Der Tag." There seemed little doubt in anyone's mind that "the Day" meant Japanese conquest of the Philippines—and, of course, much more.

These bluejackets showed every outward indication of being entirely loyal to the United States. As I look back now I wonder if they did not have a very good hunch as to when war was coming, for each managed to wangle a swap with a man on another ship. Their new ships departed on the outbreak of war; ours remained for the hopeless task of defending Manila Bay.

The strategic preparation for conquest was nothing more than having a part of Japan functioning in many localities of the Philippines before war in a social, economic, political, and secretly military sense. On the other hand, several tactical preparations for conquest were noticeable.

The first of these case histories deals with the destruction on the ground of all but a few of the U. S. Flying Fortresses stationed on the Island of Luzon the first day of war. The story was that a Japanese beer and fruit stand close to the big army air base at Clark Field, north of Manila, kept a watchful eye on activities there. Early Monday morning, Manila time, several hours after word had been received of the Pearl Harbor attack, the Forts took off on a warming-up run. They were awaiting permission from Manila to conduct an offensive bombing mission against the Japanese airfields on Formosa to the north. Permission apparently was not received.

When the planes took off, a radio transmission left this Japanese fruit stand. Another message followed a short time later when the planes returned. Then, with bombs in racks and crews standing by our planes on the ground, enemy bombs fell on the airfield. Clark Field was knocked out of the war without delivering a single offensive stroke!

Had this Jap fruit stand radio said, in effect, to bombers already on their way from Formosa: First, "Hold it, no planes here now," and later, "Okay, gang, come and get 'em"? If so, it performed a great service to the honorable Empire builders, and at little cost to them. This radio set and its operator were discovered and destroyed—but too late.

A few planes managed to get clear of the field by taking off on the first excited cries of warning that preceded the blast of bombs by seconds. Among these few planes was a P-40 piloted by my friend, Lieutenant

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*United States Naval Institute Proceedings.

Church, of the Army. Later, *Time Magazine* featured a story of his daring and aggressiveness. With another plane he re-visited Clark Field after it had been occupied by the Japs and strafed a line of parked bombers. He crashed his blazing plane into these as his last heroic and defiant act of life.

The second case history deals with Nichols Field in Manila, where many of the Army medium bombers were based. Most of these were destroyed on the ground Monday night in a full moon bombing attack. An Army aviator we fished out of Manila Bay subsequently told me that just as the bombs started to fall on Nichols Field a couple of MPs ran into the radio house and shot a man at the transmitter key who had been sending dashes on the radio. Presumably the enemy planes came in on this beam. The radioman was in uniform. Whether he was a saboteur spy, or a traitor well paid by the enemy, our friend did not say. The point is that the enemy had made careful plans for this tactical use of radio. It indicates thorough and extensive staff work between the sabotage units in Manila and the Japanese military command. Their plans to make these tricks work were apparently better laid and more skillfully executed than our counterplans to prevent such possibilities. From our ship we watched this spectacular and gruesome sight. First we heard the drone of engines, then we saw the planes pass under the moon a few seconds before bomb flashes came from Nichols Field.

Captain Colin Kelly's subsequent hit on the *Haruna* was the more remarkable because it was made from a survivor plane. How much more costly in Japanese shipping might the Luzon landings have been with attacking American air power measured in squadrons instead of a few lone planes?

The enemy now had complete mastery of the air, with all its advantages, which seemed to superimpose themselves one upon another in algebraic progression.

One case history deals with the destruction of the Cavite Navy Yard by air attack the first Wednesday after war. In this case we credit the Japanese with sabotage organization and military intelligence. Toward the end of the noon hour, Wednesday, December 10, 1941 (Manila date), squadrons of Japanese large two-engined Navy bombers winged their way over Manila Bay and plastered the Cavite Navy Yard unopposed from the air. From the ground they were fired at by obsolete 3-inch guns with no modern fire control. From ships in and near the yard they were fired at by more of the same old 3-inch guns with no fire control at all; and by all stations they were barked at harmlessly by 50-caliber machine guns. It was a beautiful clear tropical noon hour, with blazing sun and not a cloud in the sky. The planes were silver color. When one caught the reflection of sun now and then in a dip or turn, it flashed like a minnow. We counted in each of the first two waves an arrowhead-shaped spear made up of three sections of nine planes each. The third wave seemed to have about 18 planes. One plane from each wave seemed to be a little lower than the rest and trailing somewhat. Subsequently we got to recognize this bird as photo-Charlie.

When the first crash of bombs fell into the Cavite Navy Yard, our fire-fighting parties responded bravely. They rushed into the burning torpedo shop and other dangerous and important buildings still standing. No water came from their hoses to reward their heroic gesture.

Later investigation disclosed that control mechanisms on the water pressure pumps in the pump house had been smashed with sledge hammers. These hammers had been left on the deck near the pumps in mute evidence. No personnel were in attendance when the first trouble-shooter party ran in to see why there was no fire-main pressure. Sabotage squads had done their timely work well. The yard burned on, the flames as unopposed as the bombers had been a few minutes earlier.

The ammunition depot was not hit that day. As this fact became evident with the withdrawal of the enemy bombers, a dozen local Japanese rushed the depot with fire arms and dynamite. Some were shot down by guards who had valiantly stood their ground. The remaining Japs fled. One of the bodies was later identified as that of a barber who had a little shop just outside the navy yard gate. He and his friends apparently had their battle stations and were apparently well drilled in their duties.

No doubt the leading citizens of the local Japanese colony in the barrio of Cavite turned over the evacuation navy yard to the military with full honors incident to the occupation of Manila. We blew up the ammunition depot ourselves before evacuating the area.

This case is representative of Japanese intelligence and sabotage planning in all phases of conquest in the Far East. Similar cases transpired on a grand scale. Our

Captured Japanese photograph showing interned American civilians at the Santo Tomas internment camp near Manila. This camp was liberated by the 1st Cavalry Division.

Official U. S. Navy Photo

British and Dutch allies were victims of equally thorough sabotage organization. The pattern did not differ from the German model used so effectively in the conquest of Europe.

The Japs made certain definite preparations for the Bataan Peninsula Campaign which they knew would be forthcoming. There were caves on the seaward shore of the Bataan Peninsula, beautiful caves which we, aboard passing Navy ships, used to admire through binoculars as we steamed up the coast or anchored in a cove sometimes between target practice exercises. I have passed within a hundred yards of some of these caves in a boat on the way ashore with swimming parties before the war.

Apparently the Japanese had buried mortars, machine guns, and ammunition in these caves at some time before the war. Stores of food, carefully preserved against time and moisture, were apparently buried in this locality also. Some small ravines led up into the jungle from a group of these caves, and in these ravines wells were dug. They had been covered over, and their very existence was a secret.

Some weeks after the Japanese had started their push into the Bataan Peninsula from Manila, they were stopped by the excellent United States Field Artillery units holding positions on high ground covering the flat-land approach from Manila. A battle of fixed positions resulted. To harass our positions from the rear and to create a diversion, the Japanese had landed an estimated 600 specially trained Commando jungle troops on beaches near these caves.

These landings were made secretly at night. The enemy troops dug themselves in, established defensive artillery and machine-gun positions, and set up housekeeping around their wells as the social center of the community. They sent out snipers nightly with food and water rations to last a few days. These snipers went unopposed to positions on trails leading between our various jungle centers of activity. The snipers would take concealment and pick off the end man from behind after a column had passed his position. At the time it was believed that these snipers infiltrated through the front lines at night from enemy positions. Undoubtedly many did; but others were already in our rear, as it turned out later.

The first time this became known was when a naval officer was taking a hike in the country one day from our naval section base at Mariveles Bay, at the seaward tip of the Bataan Peninsula, opposite Corregidor. As he was sauntering along a jungle trail, thinking perhaps of some nice fresh roast monkey, or of the carabao stew he might expect for supper, he was startled by some Japanese soldiers in the trail ahead of him, in uniform and of course fully armed. These soldiers tried to capture our young hero alive, but he made a full power run back along the trail toward Mariveles, with the Japs in pursuit. Failing to capture him, they fired, and missed. He made the best possible time back to the section base and reported the incident. This bit of interesting intelligence was broadcast by voice radio to various Army and Navy units. I heard it on the bridge of my ship in Manila Bay.

A task force was organized consisting of a 12-inch mortar group on Corregidor, an Army officer atop some tall jungle tree on a hill overlooking the ravines as spotter, with walkie-talkie radio; an infantry company of Philippine Scouts; and a U. S. Navy vessel of the inshore patrol. The mortar group lobbed some big ones into the ravines. The Navy vessel poured some 3-inch stuff into the mouths of the caves from seaward, and the infantry closed in to finish off such game as might be flushed from hiding by the above fire. This infantry detachment ran into some pretty stiff fire. So, more artillery pounding was requested. The remaining Japs retreated to the tops of the cliffs and dived to their deaths below. Three hundred Jap bodies were buried when the fighting stopped after several days of stiff resistance from this enemy detachment.

So far as I know the time that these enemy troops landed in our rear was never determined. But the incident brings to mind a conversation I heard one night on the bridge radio. As the Japs were undoubtedly listening in at the time, they must have been aware of how much we knew of the adventure.

One night toward the end of December we were poking around Manila Bay slowly in the pitch dark looking for anything out of the ordinary, when the bridge radio loudspeaker proclaimed in a startled voice that three ships were lying just to seaward of Mariveles Point. Were they friendly, the voice wanted to know? The senior naval officer afloat in Manila Bay said he had no information of three ships that might be there, but that there was so much Allied shipping coming and going, and so many Philippine coastal vessels turning up unexpectedly, that he could not assume them to be enemy without further information. Further information was soon forthcoming from the same voice on the small patrol yacht to the effect that the vessels appeared to be painted with striped camouflage. One of our ships was directed to verify the whole thing at dawn. There was nothing in sight in this area at dawn, of course, so the whole matter was dropped. Looking back on this conversation, I believe that the Japanese troops may have been landed that night.

The uniform of these enemy troops showed forethought, planning, imagination, and good practical common sense. One of these jungle sniper uniforms was on display at Mariveles later. It was of jungle green, with streaks and blotches of different shades. The shoes had a superimposed undersole shaped like the hoof of the wild carabao, indigenous to the Philippines. Such marks in a sandy brook bed were not of themselves cause for alarm. After the sniper had climbed his tree, he would pull a green mosquito netting over his body and

most of the rifle. This increased the camouflage and afforded mosquito protection.

Our most successful defense against these Japanese jungle snipers was found to come from Moro warriors from the southern Philippines. These wild men of the jungle wore a G string and a long knife for their uniform. One of these invaluable allies would stalk a Jap sniper. It might take half the day to locate him even after arrival in the area of the last sniper attack. Then the Moro would noiselessly glide to a tree near the one holding the Jap, would climb it barefoot to near the top, climb out on a limb and drop to a branch of the desired tree. He would then adjust his position noiselessly until he was on a limb over the prone Jap, and would then fall on him with his knife. A few Jap prisoners taken on Bataan professed great distaste and fear of these Moro tactics.

Japanese tourists, geographers, fishermen, farmers, and photographers were legion out there. They were everywhere, sticking their noses into everything. They must have had access to about every picture (except military) taken in the Far West in general and the Philippines in particular. Photo-information ran the gamut from the large Rising Studio (why leave out the "sun"?) in the resort town of Baguio in Luzon, where everything was Japanese from ownership on down, to the usual run of Manila photo shops. These latter usually had either a chemist, or clerk, or bookkeeper, or messenger boy from the Japanese colony—at least, somebody in the organization somewhere to snag off an extra print of a strategic picture of whatever might come up from time to time.

The Japanese military staff work in preparation for the invasion of Luzon must have been thorough, accurate, and realistic. No obvious flaws were apparent. They did exactly what we expected them to try to do, and in the conventional sequence:

(1) Destroyed local American air power the first day of war.

(2) Continuous bombing of shipping in Manila Bay from the second day on.

(3) Established beachheads at Legaspi, Southern Luzon, and at Linguayan to the north, with the greatest early show of strength south in an attempt to divert and confuse our ground forces (dates not certain).

(4) Destruction of Cavite Navy Yard third day of war.

(5) Support of beach positions by the arrival of eighty transports at Linguayan and forty at Legaspi. The invasion was now on.

These scenes of Japanese landings were exactly where we had thought them most probable, and where *Time Magazine* some months before war had predicted they would be because of the flat low country between these sites and Manila.

The first hostile action against the Philippines was many hours after we had got word out there of the treacherous attack on Pearl Harbor. What, then, is the answer? Supposedly when two commanders appraise each other, they make plans which will checkmate any foreseen attacks of the adversary. Unforeseen attacks, then, become the ambition of a military commander. This is reflected in the adjective of the expression to achieve surprise.

Since there was no surprise in the opening phases of the Philippine campaign, and no unforeseen attacks developed, what explains the tragic blunders we made out there, resulting in a plight where the heroic last stand of Bataan and Corregidor became necessary? One answer might be that the Japanese achieved surprise in the Philippines by destroying the air and sea forces of our great advance base at Pearl Harbor. That answer stands up only if you believe that had Pearl Harbor *not* happened, the air force and ships there destroyed could and would have relieved the garrison on Luzon. But how? The Marshall and Caroline Islands were fortified, and American amphibian power was still in the planning stage at the time.

Are we to judge that Japanese preparations for the Philippine campaign included a more accurate and realistic appraisal of the situation than ours? Did the Japanese arrive at a correct estimate of the situation when they planned on being able to destroy American air power on the ground the first day at the Luzon bases, instead of figuring on our air power destroying them on the ground at their Formosa bases? We have discussed a few of the Japanese material preparations, realizing that there were many more that we have not mentioned. It is obvious that their mental preparations were equally realistic. Were ours?

Wreckage at Cavite Naval Station near Manila. Japanese saboteurs ashore gave all possible aid to the bombing compatriots. This is a scene after the first Jap blows in December, 1941.

Official U. S. Navy Photo

Return of the National Pistol and Small-Bore Matches

by Leonard J. Grassman

BACK on the sports stage after a wartime of more businesslike shooting, the nation's marksmen finished their first postwar National Pistol and Small-Bore Matches at Camp Perry, Ohio, early in September. About 1,000 keen-eyed contestants lined up along the two-mile Perry firing line and burned up over a million rounds of small-caliber ammunition and perforated target bull's-eyes all the day long from August 31, through September 8, firing the multiple shot which heralded the return of a greatly expanded and invigorated American sport.

Purpose of these matches is not to dispose of surplus ammunition but to provide a national benefit in addition to supporting a great sport and a nerve straining test of individual skill. The benefit, rarely apparent in peacetime, is obviously present when our nation is threatened by war. Our national marksmen became the teachers of our adaptable but rusty citizenry at the outset of the emergency which preceded the late war, and the National Rifle Association provided training films and expert gunnery instructors who taught the expert use of small arms to the officers and men who later became the small-arms instructors for our armed forces.

Early in the century, when the rifle and pistol ceased to be essential tools of daily life and their possession became a matter of law, the marksmanship of Americans had declined greatly from the standards of the famed frontier shooting. The War Department, always aware of any threat to National Security, decided some precaution should be taken to preserve at least a nucleus group of skilled marksmen to train our fighting forces in the event of future emergencies. To accomplish this, the National Board for the Promotion of Rifle Practice was formed. The Board, composed of twenty-one members appointed by the Secretary of War from representatives of the War and Navy Departments, the Army, Navy, Marine Corps, National Guard, Organized Reserves, National Rifle Association, and the country at large, has for its president the Under Secretary of War. The present board, in addition to its president, the Honorable Kenneth C. Royall, is composed of General Courtney H. Hodges, Commanding General of the First Army, War Department representative; Captain Clifford H. Duerfeldt, Navy Department representative; Major General B. B. Miltonberger, Chief of the National Guard Bureau; Major General E. S. Bres, Executive for Reserve and ROTC; Major General Milton A. Reckord, Adjutant General of the State of Maryland and Executive Vice President of the National Rifle Association; Colonel Emerald F. Sloan, USA (Ret), Director of Civilian Marksmanship, Executive Officer of the National Board; Colonel Christian H. Clarke, Jr., representing the Director of Organization and Training, War Department General Staff, and Colonel Joseph K. Bush, Army Ground Forces.

Interest in such skill had originated in Europe but as an organized sport it is primarily American. In 1871, the National Rifle Association of America was chartered in New York. A great part of its membership was composed of members of the civilian National Guard Units of a number of States. In 1903, the Office of the Director of Civilian Marksmanship was set up in the War Department with appropriations and authorization to provide certain War Department equipment to civilian rifle clubs which had been organized in accordance with regulations approved by the National Board for the Promotion of Rifle Practice. The Director issues Army Qualifications Badges to civilians, also. Because of his close association with the activities of the National Board, the Director of Civilian Marksmanship is normally appointed as Executive Officer of the National Board. Present Director is Colonel Emerald F. Sloan, USA. He and the Assistant Director, Lieutenant Colonel Paul F. Roberts, Inf., have had a great deal of experience in working with the National Guard, Reserves, and civilian riflemen, and are always available for information on organization of rifle clubs and procurement of government materials for such organizations. Three classes of applicants which may receive such assistance are schools and junior and senior rifle clubs organized for target practice.

Schools, in order to receive the benefits, must maintain during the entire school year a uniformed corps of cadets, at least 40 in number, above the age of 14 years. They must have an adequate course in military training and must conduct target practice in accordance with the regulations prescribed by the Board. Targets, rifles and ammunition in certain specified amounts are authorized for issuance. Senior rifle clubs may receive similar benefits by enrolling with the Office of the Director with a

membership of at least 10 physically fit male citizens above the age of 18. They must not be eligible to receive federal aid for such activity from any other source and must maintain affiliation with the National Rifle Association and must carry out target practice as prescribed.

Junior rifle clubs have pretty much the same stipulations but must be under the sponsorship of an adult, responsible, male citizen, and have proportionate marksmanship qualifications and courses. In order to receive the issue of nonexpendable equipment all such organizations must furnish a surety bond, provide for secure storage of equipment, pay all transportation charges and have suitable range facilities. They must also submit at the close of each calendar year an annual inventory of U. S. property and an annual report of firing.

Contemporary interest in the use of small arms has been stimulated by personal experiences in the armed forces during the war, by enlarged gunnery and sporting clubs, by preparedness-minded organizations, schools and other such units. It is anticipated by the small-arms enthusiasts that the sport will be greatly enlarged and more popularly received in the future.

The first of the National Matches was held at Sea Girt, New Jersey, in 1903. The Matches of 1905 and 1906 at the same location. The 1904 Matches were held at Fort Riley, Kansas, and in 1915 and 1916, they were conducted at Jacksonville, Florida; in 1919, again in New Jersey, at Caldwell. All other matches have been held at Camp Perry, Ohio; the first in 1907 and the last in 1941.

In the first matches, participation was limited to teams from the regular services and the State National Guard organizations. The National Individual Rifle and Pistol Matches were inaugurated in 1904 with 187 entries in the rifle and 38 in the pistol. With the passage of the National Defense Act in 1916, participation of civilian teams from each state was authorized and a Small-Arms Firing School became an important part of the National Match Program. The National Pistol Team Match was inaugurated in 1920 with 36 teams firing. In 1939, there were 128 entries in the rifle team match, 33 in the pistol team competition and 2,037 in the National Individual Rifle Match and 622 in the National Individual Pistol Match.

The National Championships of the National Rifle Association have been an important part of the National Match program from the beginning. In 1940, there were 91 NRA matches.

The National Matches sponsored by the War Department consist of the National Trophy Rifle Team, the National Trophy Individual Rifle, the National Trophy Infantry Team, the National Trophy Pistol Team, and the National Trophy Individual Pistol Match. Many new matches have been created for this year's and subsequent matches. During the 42 years since the adoption of the National Matches, numerous Trophies have been accumulated and these trophies are presented to the winning teams or individuals who usually retain possession of the original trophy for one year and are given a miniature replica thereof for their permanent possession. The contestants also fire for small money prizes.

Marksmanship as a sport is comparatively low cost after the initial outlay for equipment, which, in itself, isn't great. It is a family sport in which all members of the family regardless of sex may indulge. It is an ideal week-end sport, and bows neither to weather conditions nor season since there are ample facilities practically everywhere in the nation for indoor and outdoor shooting. It is a sport of skill and a test of temperament, granting great satisfaction.

Through the years it has swept a long way from the career soldier's bivouac but still remains the most engaging sport for regular and reserve officers who maintain a man isn't a soldier unless he can shoot, and military men have long and successfully competed on the range, individually and in civilian or military teams.

Now, as the interim Army is more settled and officers are becoming accustomed to their newest assignments, military teams are springing up on a large number of camps and posts, and military activity in the field of marksmanship contests promises to be greater than ever.

The same picture is true for the civilian side of the picture. Veterans, loath to set aside the skill in shooting attained in service, are either joining or forming marksmanship organizations. Although this year's match was the greatest in the history of the National Matches, shortage of housing facilities and difficulties in transportation, and costs have prevented it from being as great as it might have been. In the next few years, when such limitations are removed, the National Matches are expected to claim numbers as great as other national sports.

This year's match produced some remarkable scores despite the rust collected through lack of target practice during the busy war years. Arthur Cook, 18-year-old youth from the District of Columbia, won the junior small-bore rifle championship at Camp Perry with a 1,582 score. One of two 18-year-olds to make the Dewar international team (teams competing from the English speaking countries) this year, Cook beat out John Kelley of Fort Worth, Texas, who had a score of 1,580. The national small-bore title went to G. Wayne Moore of Washington, Pa., who used a borrowed rifle to post 3,184. The pistol championship title went to Harry Reeves, a Detroit policeman who attained the highest score ever posted at Camp Perry. He scored 2,588.

Such shooting as this places the famed marksmanship of our Daniel Boones and Dead-eye Dicks of our more romantic pioneer days in a rather amateurish light by contrast, and as the fever for the small arm spreads from our present 500,000 marksmen into the millions, our nation will have no fear about a shortage of teachers in expert marksmanship in the event of a future emergency.

AGF Outlines Organized Reserve Training Program

ARMY Ground Forces has outlined a two-year training program for the Organized Reserve Corps, which makes the AGF not only responsible for the training of the Infantry, Armored Cavalry and Artillery, but also for the training of units of the technical services which would ordinarily be attached to a field army.

The program provides for the training of Signal, Infantry, Airborne Infantry, Armored Infantry, Field Artillery, Tank Destroyer, Armored Cavalry, Antiaircraft Artillery, Seacoast Artillery, Military Police, Engineer, Chemical, Medical, Ordnance and Quartermaster units, for ORC bands and for Order of Battle and Photo Interpreter teams.

They are based on a minimum of 50 home or "armory" training periods annually, of two hours each. Field training will consist of a 15-day period annually, but since such training is not planned until 1948, a field training program will be issued at a later date.

The programs are outlined to provide refresher training, initially, in basic subjects, followed by progressive training in tactical and technical subjects. All units will receive instruction in such basic subjects as administration and mess management, first aid, chemical warfare, customs of the service, dismounted drill and ceremonies, domestic disturbances and martial law, intelligence, signal communication, map and aerial photograph reading, methods of instruction, military law, organization of the Regular Army and Organized Reserve Corps, protection of military information, censorship, psychology of leadership and utilization of training aids.

This training will be followed by technical and tactical subjects of the particular arm or branch, including logistics, motor vehicle operation and maintenance, air-ground liaison, the artillery-infantry-tank-engineer team, military history, map exercises and maneuvers, staff procedure, supply, terrain appreciation, weapons, tactics, amphibious operations and specialist training. Advanced training for a limited number of specialists will be conducted by means of special courses at service schools.

Tables of allowances of equipment for home training of the Organized Reserve Corps have been approved by the War Department, and units will be able to begin drawing their equipment as soon as adequate facilities for its maintenance and storage are procured, General Devers stated.

The tables of allowances published thus far cover equipment for home training of ORC Chemical, Antiaircraft, Engineer, Field Artillery, Infantry, Medical, Ordnance, Quartermaster, Signal, Finance, Special Services, Counter Intelligence, Order of Battle, Photo Interpreter, Transportation Corps and Airborne Infantry units. Virtually all organic equipment of each arm, branch and specialty is made available, plus necessary Air Forces, Chemical, Engineer, Medical, Ordnance, Quartermaster, Signal and Transportation equipment.

The amounts of equipment authorized vary with the class of unit, whether A, B or C. Class A units are organized at full strength of officers and enlisted men, and will be as fully equipped as possible. Only essential individual and training equipment will be furnished Class B units, organized with full officer strength and enlisted cadres, and Class C units, with full officer strength only.

To alleviate problems of maintenance and storage, only 25 per cent of authorized vehicles will be issued, and 25 per cent of specialized equipment such as artillery pieces, heavy engineer equipment and tanks. Such heavy equipment will be issued to Class A units only, except in the case of Class B Field Artillery battalions, which will be issued one appropriate artillery piece. Normal engineer, ordnance, chemical and quartermaster equipment which accompanies vehicles will be issued on a one-per-vehicle basis.

In addition to individual arms and equipment, which will be issued to all members of Class A and B units, and uniforms, which will be issued to all enlisted members of the ORC, many specialized items of equipment available from World War II stocks will be furnished for home training purposes.

Senior ORC instructor's offices in each state are allocated training aids and motion picture projectors, and are a source of combat and training films for ORC units. The Signal Corps has already produced one film especially for ORC use, "United," Miscellaneous Film No. 1267, an 11-minute subject designed to stimulate enlistments in the Organized Reserve Corps.

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Book Reviews

TOUR OF DUTY. By John Dos Passos. Houghton Mifflin Company. $3.00.

John Dos Passos, one of America's most sensitive and talented reporters, tells an engrossing and important story of Americans in action against a background of the whole wide world. His book, told in terms of incident and human anecdote, poses the life-and-death problem America faces today: How to carry over into the postwar world the miracle of our wartime effort and virtue.

In *Tour of Duty* you will travel by plane, battleship, foot and jeep from Pearl Harbor to the Philippines, from Paris to Berlin. You meet the matter-of-fact courage of the guerrillas and learn details of their incredible lives.

Dos Passos is not presenting a personal point of view in *Tour of Duty*. He preaches no sermon. He is observing and reporting. Those on the spot do the talking. Their dialogue emerges with a seeming stenographic quality. Their talk emphasizes with mule-kick force the momentum we have lost in peace, but enjoyed in war.

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BEHIND THE IRON CURTAIN. By William Van Narvig. Ziff-Davis Publishing Company. $3.00.

In this book, in more than 50 chapters, the author covers every phase of Russian life, intimately and in detail. First he talks of the Russian family group, the party, the secret police, the farms, industry, labor unions, the press, black markets, the democratic concept and its meaning to Russia.

The second half of the book is presented as though written by an average Russian and tells his outlook on Russia and the rest of the world—how he feels; what he knows; what he has been taught; and, consequently, his reaction to everything from his belief that Russia alone won the war to the atomic bomb, the veto, and the United Nations. This is a book neither sympathetic to, nor critical of, the Russian people. It is completely realistic and it is vitally important, because it will help the people of the Western world understand the reasons for the average Russian's views.

William Van Narvig was born in Russia, and more than 25 years of his life have been spent inside Russia—as a student, as a soldier, as a government employee, as a businessman. He is a citizen of this country and served in the U. S. Army Intelligence as a Lieutenant Colonel during World War II.

* * *

OPERATION LIFELINE. By James Lee with photographs by Joe Rosenthal. Ziff-Davis Publishing Company. $5.00.

This is a non-fiction book that tells the story of NATS —the Naval Air Transport Service—one of the Navy's most vital arms both during and after the war.

The NATS served as the Navy's lifeline in the Pacific after Pearl Harbor and went on to play an ever-increasing role in the rapid movement of the men and supplies in this theater of operation.

Operation Lifeline brings the whole story together for the first time. It gives the details of the organization, the routes flown, equipment used, the technique of operation, and the importance of the NATS in the development of air transportation of the future.

This is one of the great stories of accomplishment to come out of the war and a tribute to the planning, coordination, and ability of this branch of the Navy's air arm. It it an engrossing account, with much information heretofore unpublished, and profusely illustrated with many fine pictures.

James Lee, Washington correspondent for International News Service, gathered the text material for this book on the scene by invitation of the Navy. Joe Rosenthal is famous as the Associated Press combat photographer who photographed the Marines raising the American flag on Iwo Jima.

* * *

THE BATTLE OF GERMANY. By Lieutenant Theodore Draper with maps and drawings by Sergeant Walter H. Chapman and a Foreword by Major General A. R. Bolling. The Viking Press. $5.00.

This history of the 84th Infantry Division is the first divisional history to be accorded the recognition of publication by a general publisher. Hundreds of details not told in press reports are included in this excellent history, which is illustrated with more than 100 photographs.

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CHILDREN OF YESTERDAY. By Jan Valtin. The Readers Press. $3.00.

As Private First Class Clarence Krebs, Jan Valtin was a member of the Public Relations Office of the 24th Infantry Division during the division's action in the Philippines. He and Captain Lloyd Price, *Dallas* (Texas) *News* reporter and Public Relations Officer of the 24th Division, conceived the idea of writing a history of their division's combat action. Out of this came the now popular seller *Children of Yesterday*. Entitled "Japs Die Hard" at first, the entire royalties of the book are to go to the 24th Infantry Division Association.

This book is the story of the men of the 24th Division who fought the war in the Philippines. Hundreds of them are mentioned by name.

Vivid descriptions of the combat actions on Leyte, Mindanao, and Corregidor are to be found in the book's pages. It is a book worth reading.

* * *

A PRIMER OF HORSEMANSHIP. By Sanford Cummings. The Marcel Rodd Company. $1.95.

A Primer of Horsemanship is intended to fill more adequately than any other book previously available the constant demand for a complete "set of rules" to the sport and art of riding, and to give the reader in handy question-and-answer form all the information he could possibly need as to the care and handling of riding horses and the choice, care, and nomenclature of all riding equipment. The volume is divided into three sections—the horse, the rider, and how to ride a horse. An internationally known sportsman and a former instructor at the Cavalry School, Mr. Cummings is a recognized authority.

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THE BASIC MANUAL OF MILITARY SMALL ARMS. By W. H. B. Smith. The Military Service Publishing Company. $5.00.

The enthusiastic reception given the first editions of this book by the military journals, civilians, soldiers, newspapers and magazines immediately established it as the unique small-arms handbook.

It covers more than 100 weapons in detail, showing specifically in over 500 action-photos how to load, operate and strip the infantry weapons of the world powers. The text is plain and easily followed. The only way you could get the mass of information packed into this book would be from scores of manuals—many of them unobtainable.

AS HE SAW IT. By Elliott Roosevelt. Duell, Sloan & Pearce, Inc. $3.50.

In informal style, this book presents the story of Franklin D. Roosevelt's thinking and of the aims behind the conferences that shaped the policy of victory and set up the framework of the peace organization to follow. Based upon discussions, unpublished correspondence, firsthand observations and, above all, intimate talks, it discloses a great number of new and extremely interesting facts about the late President, his opinions of the other great leaders, his ideas, and his plans for the future role of America in the world.

It covers the period from the Atlantic Charter meeting in the Atlantic to the Yalta Conference and after. Elliott Roosevelt acted as his father's aide at all of the important Big Three conferences except Yalta, and because his father wished to talk freely with a member of the family when the long days of work were done the son was given a unique opportunity to see behind the scenes of those history-making meetings. He was able to observe world leaders, such as Churchill and Stalin, in their relaxed moods as well as their formal poses, and the sidelights this record throws upon such figures are often astonishing. In writing this book, filled with warm understanding and loyalty to his father's aims, Elliott Roosevelt has performed a service for which countless Americans will be grateful.

* * *

YANK: The G.I. Story of the War. By the Staff of *Yank*, The Army Weekly. Duell, Sloan & Pearce, Inc. $5.00.

This book, in preparation since V-J Day, tells the soldiers' own story as reported by soldiers from start to finish —from Pearl Harbor to V-E Day and the Japanese surrender, and on into the occupation and demobilization period.

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The book is illustrated with hundreds of action photographs, on-the-spot drawings, and a few appropriate cartoons.

No part of this new book appeared in the anthology of stories, humor and cartoons entitled *The Best From Yank*.

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IRON OUT OF CALVARY. By Walter Phelps Hall. Appleton-Century Company, Inc. $4.00.

Here, in a single compact and readable volume, is the full military, political and social history of the war just ended. It is a clearly written history with a realistic viewpoint.

* * *

PAPER BULLETS. By Leo J. Margolin. Froben Press, New York. $2.50.

Lots of hot and cold moving steel, thrown at the enemy at the right place and time, has been the traditional way to win wars. It still is. But *Paper Bullets,* the first story of combat propaganda in World War II, tells how hot words and ideas, thrown at the enemy at the right time and place, shortened World War II by many days, thus saving countless American and Allied lives.

War, the author points out, is also hurling ideas at the enemy, prospective or real. War is also in the minds of men as much as it is on the battlefield. In fact, Mr. Margolin, a veteran newspaperman turned propaganda expert, proves that psychological warfare (the fancy word for propaganda) has won and lost wars before a single shot had been fired.

Mr. Margolin vividly relates the propaganda moves leading to World War II. Quite obviously America was as unprepared for war mentally as it was militarily. The chapter "Germany In America" is exciting reading, as is most of the book, but it is a shameful chapter in American history. How a "savvy" America could have allowed the Germans, their Bunds, their propagandists and their spies, to have literally stepped all over America, is not something most Americans would like to remember. But read it we must and its lesson must be taken to heart.

Mr. Margolin served with the Psychological Warfare Branch of Allied Force Headquarters in the Mediterranean for sixteen months. He views the workings of propaganda from the watchtower of a man who has seen this deadly weapon work before, during and after hostilities. In writing *Paper Bullets* he has done a great service to the professional soldier and the civilian.

THE BRERETON DIARIES. By Lieutenant General Lewis H. Brereton. William Morrow & Company, Inc. $4.00.

This is the story of the War in the Air in the Pacific, Middle East and Europe; 1941-1945. It is the frank and uncensored day-by-day account of the war as seen by General Brereton, long-time champion of air power. This is the first blow-by-blow story of the war by a top-flight air general who saw action in all the major theaters of operation.

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* * *

70,000 TO 1. By Quentin Reynolds. Random House. $2.50.

Lieutenant Cordon Manuel of the 64th Squadron, 43d Bombardment Group, bailed out at 300 feet above the water, five miles off the coast of New Britain, with one leg broken and the other full of fragments. In this book Mr. Reynolds tells Lieutenant Manuel's story in an exciting narrative.

The book shows through the experiences of Lieutenant Manual what a man can do in a tight spot if he will keep his head. It is a book of valuable reading for every member of the armed forces.

* * *

WE CAUGHT SPIES. By John Schwarzwalder. Duell, Sloan & Pearce. $3.00.

Major Schwarzwalder has done a capable job in turning out a book that describes the activities of the Army Counter Intelligence Corps. He tells how enemy agents were caught and their plans upset. The book is full of actual cases that give the reader a real insight into the workings of CIC men.

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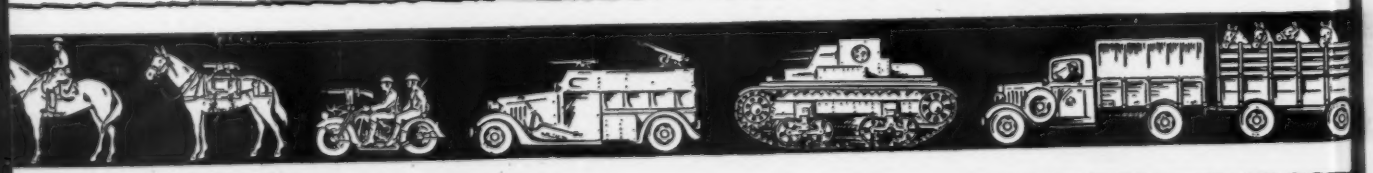
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